STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

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READER COMMENTS 11

AS THE EDITOR VIEWS THE NEWS 15

NEWS
- Wolman Explains How "Federal Labor Policy Has Failed" 17
- National Policies Discussed at Founders' Convention 17
- Steel Layoffs Less Than 10 Per Cent 19
- Upturn by March, Conference Board View 20
- Steelworks Operations for the Week 21
- Financial News of the Steel Industry 21
- Warehouses Adjust Methods To Satisfy More Exacting Demand 22
- Domestic Output of Tungsten Ore Gains 23
- Men of Industry 24
- Obituaries 25
- "Life, Liberty and"—Machinery 27

MIRRORS OF MOTORDOM 29

WINDOWS OF WASHINGTON 33

EDITORIAL—Now Is Good Time To Ask for Itemized Statement on Relief Costs 35

THE BUSINESS TREND
- New Demand Insufficient To Check Downward Trend 36
- Charts and Statistics 36-37

TECHNICAL
- Building Motors by Modern Methods 38
- Birmingham Acetylene Meeting 46
- Cleaning Air Electrostatically 59
- Welding Society Meeting 65
- More Die Castings in Automotive Uses 68
- Purification Plant of Welded Steel 70

MATERIALS HANDLING
- Handling Brass Billets and Slabs 49

SURFACE TREATMENT AND FINISHING OF METALS
- Finishing Steel Casement Windows 52

PROGRESS IN STEELMAKING
- Pickler Is Designed Compactly 56
- New Ceramic Packing for Gas Washers 58

WELDING, ETC.—*Robert E. Kinkead* 60

POWER DRIVES
- Distribution Systems Need Modernizing 63

NEW EQUIPMENT 71

RECENT PUBLICATIONS OF MANUFACTURERS 74

MARKET REPORTS AND PRICES 75
- The Market Week 76

BEHIND THE SCENES 88

CONSTRUCTION AND ENTERPRISE 98

INDEX TO ADVERTISERS 104

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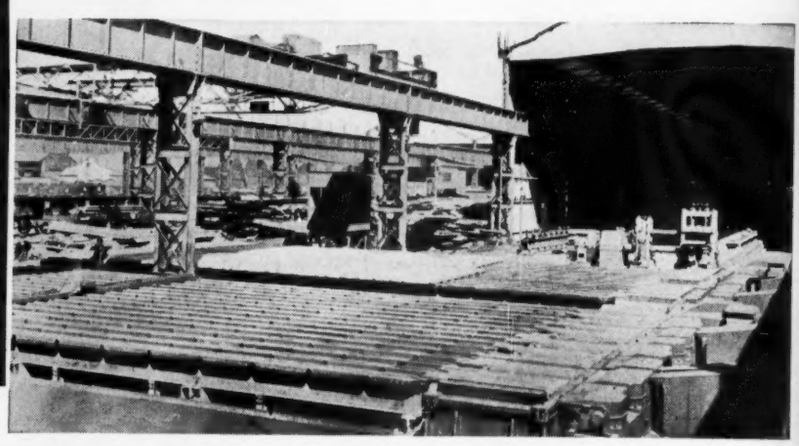
BILLET COOLING BEDS *by Morgan*



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As the Editor Views the News

A SIGNIFICANT phenomenon of the current anvil chorus of criticism against certain government policies is that the protests are being voiced with equal vehemence by liberals and conservatives. Two years ago it was comparatively easy to deflate a critic by pinning on him the label of "economic royalist". Today the most outspoken opponents of the planned economy are those who at one time were drafted to participate in the planning. It would be difficult to find a "tory" who has denounced administration policy as bitterly as General Hugh Johnson, or any one of a dozen critics who formerly were identified with the New Deal.

• • •

To be specific, consider the statements of Dr. Leo Wolman at the meetings of the National Founders association (p. 17) and the New England council.

Policics Have Failed

Dr. Wolman has served in various capacities as one of the administration's leading advisers on labor policies and problems. Last week he declared that the administration's labor policies, brought to fruition in the past four years, "have failed to accomplish their purpose." And with increasing frequency, one finds one-time ardent New Dealers who now say ruefully that the labor policy has worked to the advantage of certain union leaders but not to the benefit of labor union members.

• • •

Plenty of dynamite is present in the labor situation today. Prominent union leaders and eminent government spokesmen have repeatedly encouraged

Dynamite in Labor

dues paying and prospective union members to expect benefits far in excess of anything that could be delivered, even if, under a planned economy, industrial activity continued at a brisk pace. Now that activity has declined and employment has been curtailed, the chances for making good these promises are more remote than ever. Therefore, it will not be surprising if the voice of a substantial part of union labor some day will be lifted in protest against those who promulgated an unsuccessful labor policy. Shotgun labor movements never have succeeded. Until the administration recognizes that unions must earn their way to orderly progress through real service, and not through racketeer support by government laws and agencies, we will continue to witness trouble such as visited Detroit (p. 29) and Akron last week.

• • •

Three sentences in the article "Building Motors by Modern Methods" (p. 38) go right to the heart of industry's present problem of management.

A Text for Management

The sentences are: "The higher the rate for labor, especially skilled labor, the more necessary it is to insure that labor is applied productively. The higher the cost of equipment, the more essential is its uninterrupted use as a productive tool. The higher the cost of materials, the more advantageous it is to minimize time in process." These factors are particularly important in repetitive manufacture, in which the so-called mass production technique may be utilized. Westinghouse has applied the system advantageously to its new motor manufacturing aisle. It has great possibilities in many other lines of manufacture.

• • •

The recent meeting of the International Acetylene association in Birmingham (p. 46) provided a forum for the discussion of many problems pertaining to

I. A. A. in Birmingham

the application of oxyacetylene welding and cutting to the industries of the South and Southwest. Papers on the use of the acetylene process in steel mills, in structural fabrication, textile mills, pipe line work and in the welding of cast iron pipe showed how appropriately the program had been fitted to the needs of the industries in the area of which Birmingham is the hub. . . . Cleaning, rustproofing and painting steel casement windows has been developed into a continuous operation (p. 52) by a Detroit manufacturer. It is another good illustration of organizing equipment and personnel for efficiency.

E. L. Shaner

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Illustration shows ingot being removed for rolling from one of nine newly designed circular soaking pits recently installed by Inland.

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Wolman Explains How "Federal Labor Policy Has Failed"

■ THE ADMINISTRATION'S labor policy, brought to fruition in the past four years, has failed to accomplish its purpose and, if persisted in, may well lead to an exceptionally high rate of permanent unemployment, Dr. Leo Wolman told industrialists and business men at the New England council's thirteenth conference in Boston last Friday.

Dr. Wolman is professor of economics at Columbia university, was formerly chairman of the automobile labor board and of the labor advisory board for the NRA. He was one of the early corps of university advisers to the administration who apparently have wandered some distance from the New Deal.

"The four years since 1933 have been years of experiment in labor policy," he said. "Under the influence of these factors, trade unions have grown at a faster rate than ever, and have established themselves in many industries hitherto completely nonunion.

"Working conditions, in particular wages and hours, have likewise changed rapidly and extensively. The wage rates of manufacturing labor have increased by practically 60 per cent since the low month of 1933. Hours of work have in the same period declined by eight a week. The rise in wage rates has far exceeded changes in prices and in the cost of living.

"By the fall of 1937, the purchasing power of the wage rates of factory labor was 55 per cent greater than in 1927, 37 per cent greater than in 1929, 25 per cent greater than in 1933, and 12 per cent greater than in the summer of 1936.

"If these changes mean anything at all, they mean that the public policy of the federal administration has in the last four years been made fully effective, for these are, under all the circumstances, exceptional changes in the wage and hour schedules of a country. They were adopted as a means of reducing the volume of unemployment, increasing the stability of employment, and moderating traditional fluctuations in the volume of business.

"It is now quite clear that they have failed to accomplish their purpose. Throughout the American industrial system there were industries, like building and transportation, which were unable to absorb their unemployment and to return to previous levels of employment. And now that the general volume of production and employment is declining, the formula of raising the price of labor and reducing the hours of work as a means of controlling the volume of unemployment and of maintaining business prosperity is seen to have failed once more.

"The doctrine and policy on which we have acted in the past few years has failed to take into consideration the capacity of business and industry to absorb new and increasing costs . . . . costs which can be absorbed only at peak production or under conditions of rapidly rising prices."

A similar speech by Dr. Wolman featured the forty-first annual convention of the National Founders association in New York earlier in the week.

National Policies Discussed at Founders' Convention

■ AFFAIRS at Washington and their effects on industry, employment, and labor relations received most of the attention at the forty-first annual convention of the National Founders association, Waldorf-Astoria hotel, New York, Nov. 17-18.

F. R. Hoadley, president, appealed for fair play for industry and recognition by the federal administration of business principles which through many years have been proved sound.

"It is clear," he said, "that the true economic and practical basis on which to base effectual co-operation between employe and employer is not, as stated by present laws, with the employe, but also with management, which has the more complete understanding of problems which involve not only wages and working conditions, but also pricing, markets, financing and economic conditions."

In combating fallacious policies proposed by the one with little real insight into economic problems, he stated that the job of management was to lay the true facts before the public. "This does not mean propaganda—it means that widespread dissemination of hard-headed facts, the news of accomplishments of which all industry can be proud.

Franklin R. Hoadley
Re-elected president, National Founders association

"If this job is done effectively the vast majority outside of management will be able to reason clearly, to meet with straight-forward answers the hue and cry of those who attempt to lead into fog and ultimate disaster."

Discussing union leaders' frequent demands for "a fair distribution of national income" he cited figures which showed that the percentage of national income going to labor increased from 38 per cent in 1850, to 65 per cent in 1929 and to 66.5 per cent in 1936.

Mr. Hoadley believed that the only opportunity to increase labor's share still further is to increase production so that products may be marketed at prices which will attract buyers and thereby assure steady employment, adequate corpo-

rate earnings and corresponding high wages.

Stating that efficient production means high wages, the speaker declared that when labor insists on the closed shop it merely defeats its own purpose, because the closed shop in his opinion generally brings inefficient production and inefficient labor.

Price control has failed every time it has been tried, not only in the present time but throughout all recorded history, he said.

"The test of economic planning is that it will not serve the purpose of free people, and we in America are still free and intend to remain so. Economic planning must fall of its own weight because it lacks elasticity to meet changing conditions in an ever changing economic world. Any long time plan would of necessity be predicated on only one thing, regimentation through political coercion of every citizen in the country."

One of the features of the convention was an address by Dr. Leo Wolman, professor of economics, Columbia university, and formerly one of the national administration's advisers. This was substantially the same speech which he made before the New England council in Boston, Nov. 19. See page 17.

Public Education Important

If one thought was stressed more than another at the opening sessions it was the importance of management and industry presenting their story to the public in a sound and logical manner. It was emphasized by John G. Gall, counsel, National Association of Manufacturers, who discussed certain aspects of pending federal legislation, with particular reference to the wage-hour bill.

He warned that only through a more complete understanding by the public at large of the implications involved in certain pending bills will the defeat of those measures become assured. In the case of the wage-hour bill, he said, all too many—even among manufacturers themselves—apparently can see only certain points which they think may prove advantageous to themselves and their respective communities. The speaker said they seem to forget they will have to give considerable in exchange, and that in the long run they will lose.

"If people believe that the federal government should undertake to right competitive differentials they are in for a licking," he added.

He pointed out that there are more than a few aspects to trade differentials. Not only are there regional differentials, but differentials between large and small companies, between freight rates, and between foreign and domestic sellers.

Mr. Gall added that it might be well for the federal government to take steps for the protection of domestic labor against competition of much lower paid labor abroad before attempting to adjust the various competitive differentials in this country.

Many, he believed, do not realize how much the wage-hour bill encompasses. Some are of the opinion that it would affect only the large units or, at most, those engaged in interstate commerce. The speaker said it would go much further than that. They have only to reflect upon the extremes to which various governmental agencies have gone in administering NRA and other similar pieces of legislation, he said. Moreover, the law seldom ends with the original as passed. There will be amendments in all likelihood, which will carry on to extremes.

Mr. Gall mentioned the workmen's compensation legislation and the social security and agricultural adjustment acts.

"If anyone thinks the wage-hour bill, if passed, will be limited to this original measure, he is going to be fooled. He should stop and think about the cycle it will inaugurate," Mr. Gall stated.

Practical and legal procedure in meeting complex issues confronting industry in the operation of the national labor relations act was outlined by Otto A. Jaburek, the association's general counsel.

Claims of high membership figures made by the two leading national labor organizations were disputed, unbiased interpretation of their own figures indicating excess claims of about 1,000,000 in May this year.

Thousands are not paying union dues and, according to Mr. Jaburek, not more than 50 per cent of the so-called membership in some industries are contributing financially to the unions.

Many members claimed by the union have merely signed cards granting powers of attorney, the speaker estimating that from one-third to 50 per cent in recent campaigns have not signed up for actual membership. Assuming this to be true, the two active national unions have not really made a dent in the total number of workers in the country, he said.

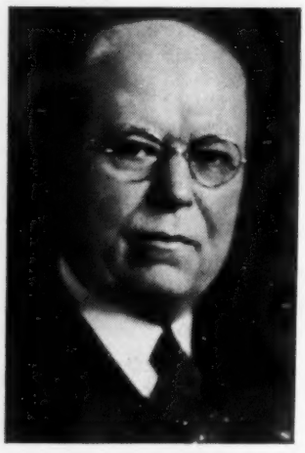
Independent Unions Larger

As many workers, if not more, are now enrolled in the independent unions as are now claimed by the national organizations. There is a tendency for many newly enlisted members in the latter to drift away after a few weeks, and Mr. Jaburek declared the insistence for the check-off was a sign of weakness.

A strong plea for laws to regulate labor unions was made by T. Y. Williams, League for Industrial Rights. Not merely because they are labor organizations should they be held accountable for their acts and observance of contracts, but because the unions are functional groups operating within the social and economic structure. He pointed out that other functional groups, including industry, are subject to regulation and in other nations regardless of the form of government the unions are compelled to obey regulatory laws. He arraigned the Detroit sit-down strikes and censored public officials who succumbed to political pressure to the extent that they practically violated their oaths of office.

Lawrence Dennis, economist, E. A. Pierce & Co., New York, recommended an educational campaign

After 40 Years: "Keep Up Your Training"



A. E. McClintock

■ Commissioner A. E. McClintock, who has just rounded out 40 consecutive years of service with the Founders association, reported that despite sharp falling off in business in recent weeks there is still a general shortage of skilled help in the industry. He urged all member companies to keep up their activities in the training of foreman and apprentices.

Member companies, he said, have not been affected as much by labor disturbances during the past year as certain other industries. Strikes at plants of association members have been relatively few. Never befort in the history of the organization, however, have there been greater demands upon the association for counsel in labor relations, particularly with respect to interpretation of labor laws, he said.

to check a trend which carries the increasing aspects of class struggle. He believed that management should demonstrate it can give labor more than politicians can.

Officers of the association were re-elected as follows: President, F. R. Hoadley, Atwood Machine Co., Stonington, Conn.; vice president, W. D. Hamerstadt, Rockwood Mfg. Co., Indianapolis; secretary-treasurer, J. M. Taylor, Chicago. A. E. McClintock, Chicago, was reappointed commissioner.

The following members were elected to the district committees:

First district—A. B. Root Jr., Hunt-Spiller Mfg. Corp., Boston; H. S. Washburn, Plainville Casting Co., Plainville, Conn.; Ernest F. Stockwell, Barbour Stockwell Co., Cambridge, Mass.; G. R. Holmes, the McLagon Foundry Co., New Haven, Conn.; and H. B. Johnson Jr., General Fire Extinguisher Co., Providence, R. I.

Second district—W. W. Bates, Delaware & Hudson Railroad Corp., Albany, N. Y.; Noah F. Young, Lumen Bearing Co., Buffalo; R. H. Goodwillie, Otis Elevator Co., Yonkers, N. Y.; Irving L. Jones, International Heater Co., Utica, N. Y.; and P. R. Van Duyne, Meeker Foundry Co., Newark, N. J.

Third district—W. S. Shipley, York Ice Machinery Corp., York, Pa.; D. C. Bakewell, Blaw-Knox Co., Pittsburgh; C. H. Hoffstetter, Odin Stove Mfg. Co., Erie, Pa.; James H. Anderson, Cooper-Bessemer Corp., Grove City, Pa.; and G. L. Coppage, Pusey & Jones Corp., Wilmington, Del.

Fourth district—George A. Seyler, the Lunkenheimer Co., Cincinnati; J. S. Tatman, Roots-Connersville Blower Corp., Connersville, Ind.; C. F. Seelbach, Forest City Foundries Co., Cleveland; George P. Waller, Wilson Foundry & Machine Co., Pontiac, Mich.; and Chester A. Peebles, Stedman's Foundry & Machine Works, Aurora, Ind.

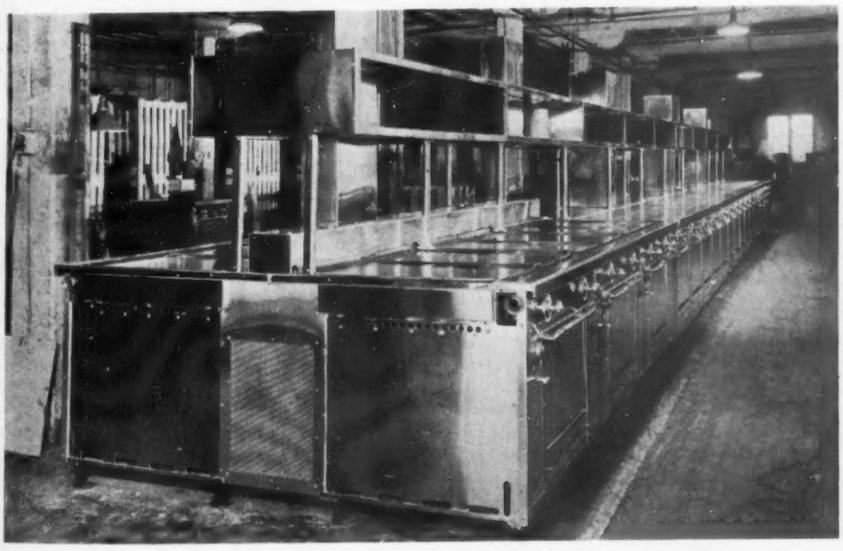
Fifth district—H. G. Myers, Gardner-Denver Co., Quincy, Ill.; H. E. Muchnic, Locomotive Finished Material Co., Atchison, Kans.; J. C. Sanders, American Foundry & Mfg. Co., St. Louis; A. H. Head, John Deere Tractor Co., Waterloo, Iowa; and C. B. Magrath, Greenlee Foundry Co., Chicago.

Sixth district—Frederic Crosby, American Hoist & Derrick Co., St. Paul; F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis.; Walter Harnischfeger, Harnischfeger Corp., Milwaukee; Harold S. Falk, the Falk Corp., Milwaukee; and W. S. Wood, Beloit Iron Works, Beloit, Wis.

Seventh district—H. E. McWane, Lynchburg Foundry Co., Lynchburg, Va.; A. I. Brainard, Beaumont Iron Works Co., Beaumont, Tex.; Houston Dudley, Gray & Dudley Co., Nashville, Tenn.; G. E. Jones, United States Pipe & Foundry Co., Bessemer, Ala.; and H. C. Stockham, Stockham Pipe Fittings Co., Birmingham, Ala.

The following past presidents of the association were elected honorary members of the council: Thomas S. Hammond, Whiting Corp., Harvey, Ill.; S. Wells Utley, Detroit Steel Casting Co., Detroit; and Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md.

Ton of Stainless Steel in 105-Foot Stove



■ **Food for 2300 midshipmen will be prepared by 27 cooks working at one time at this stove made by the American Stove Co., Cleveland, for the United States Naval Academy at Annapolis, Md. It is composed of 34 sections having an overall length of 105½ feet. More than a ton of stainless steel, made by Republic Steel Corp., Cleveland, was required for the stove which weighs almost 16 tons**

Steel Layoff Less Than 10 Per Cent

■ An authoritative survey of steel producers, representing 70 per cent of capacity, indicates layoffs in the industry amount to less than 10 per cent of the total at peak employment. Approximately 60,000 have been laid off throughout the industry, the survey indicates, bringing total employment down to approximately 550,000.

Part of the present unemployment is attributed to completion of construction work at various plants for which special forces had been required. Also operations now have fallen below a point where it is necessary to employ extra labor at time and a half for time over 40 hours weekly.

Average working schedules now are about 20 hours a week and producers generally are attempting to stagger work to keep as many men as possible on the payrolls. Presence of CIO members apparently has had no bearing on the layoff of men.

Results of a special telegraphic survey of employment in 27 manufacturing industries by the National Industrial Conference board indicates a significant decline in employment in these varied industries. However, the decline in employment has been far less than the decrease in output. Further reduction in business activity probably will necessitate the laying off of more men, the board's survey indicates.

Employment in the 27 industries, as indicated by reports from more than 2000 companies, follows: Nov. 13, 926,368; October, 967,510; August, 989,689; May, 921,224; November, 1936, 901,441.

LABOR

EXAMINER'S RULING IN BETHLEHEM CASE REVERSED

■ The national labor relations board last week set aside a ruling by its trial examiner in charge of the Bethlehem Steel Co. hearing, which provided for separation of the case into two parts after hearings had been under way for seven weeks. Action of the board was taken upon petition by the steel company.

Originally the case arose from two complaints by the Steel Workers Organizing committee as to whether the employe representation plan was company dominated and whether an election should be held to determine if SWOC should be the bargaining agent.

The labor board on Aug. 26 or-

dered the two complaints consolidated for hearing, and hearings proceeded on that basis before Trial Examiner Frank Bloom at Franklin Borough and Allentown, Pa. However, on Nov. 1, after the trial had been under way seven weeks, SWOC entered a motion by mail to the trial examiner urging the case be divided into two parts and that the charge of company domination of the ERP be decided first.

If it was held that ERP was company dominated and must be dissolved, SWOC would become the only organized contender for bargaining agent in a labor election. Thus it would be certain of victory regardless of its actual membership in Bethlehem plants. Despite protests by Bethlehem and ERP counsel, the motion was granted.

Bethlehem petitioned the labor board for an order vacating the trial examiner's ruling and for a stay of hearings. The company stated that heavy expense in defending the case would be further increased; that the SWOC motion was not made orally as required by the rules of the board; that adjournment of the hearing would require duplication of hearings and records (after several thousand pages of testimony had been taken in the consolidated hearing); that the ruling was prejudicial to the company and other defendants.

PENNSYLVANIA'S 44-HOUR LAW IS PROTESTED

■ Representatives of the iron, steel and metalworking industries protested last week against provisions of the Pennsylvania 44-hour work week law, scheduled to become effective Dec. 1.

Testimony taken at hearings on petitions for variations from the law will be studied by the state industrial board which is charged with using regulations governing enforcement.

In a number of instances, union officials and employe leaders voiced opposition to some of the provisions.

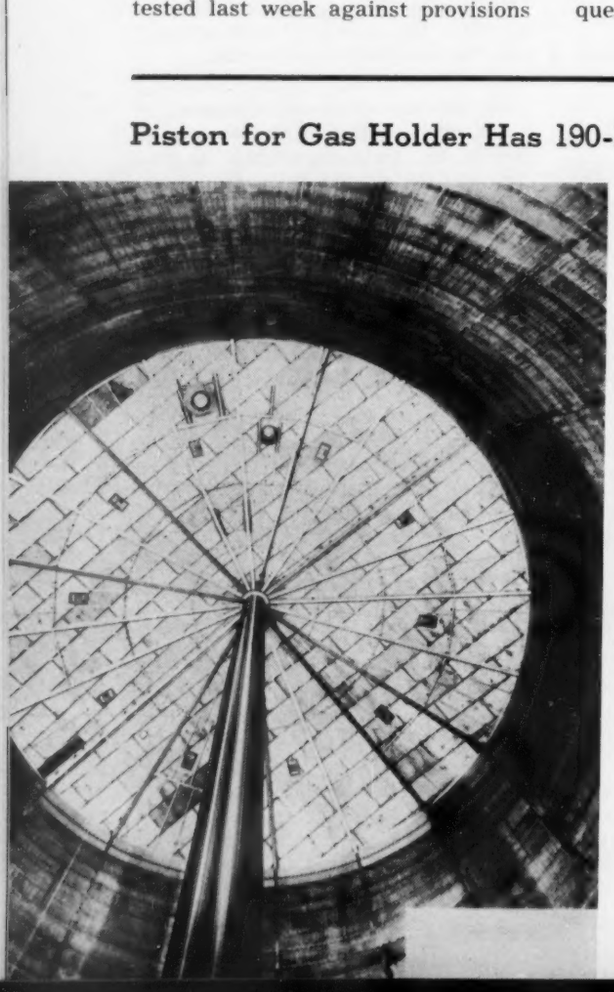
The board is expected to be reasonably lenient in its rulings concerning industries where continuous operations would make it difficult to adhere strictly to the law. In many cases the board is expected to grant permission for overtime work during business peaks and emergencies, provided time-and-a half wage is paid, and to raise the maximum to 48 hours a week for several industries.

Ralph M. Bashore, Pennsylvania labor and industry secretary, whose department is charged with enforcing the act, believes the board will allow working hours specified in bona fide union contracts signed prior to Dec. 1 to remain in force for the life of the contracts regardless of conflicts with the statute limitations.

Hearings last Saturday were reserved for metal and metal products concerns, wholesale and retail trade, and miscellaneous industries.

Seasonal industries have asked permission to average working time over periods varying from a month to an entire year. The board appears disinclined to favor such requests.

Piston for Gas Holder Has 190-Foot Stroke



■ **This piston in a 2,500,000 cubic-foot waterless gas holder, erected by Koppers Co., Bartlett - Hayward division, actually has a length of travel of 190 feet. It is 128 feet in diameter, weighs 114 tons, and was assembled within a fraction of an inch of the diameter of the enclosing shell. The Lincoln Electric Co.'s shielded arc welding process was used. The center column is 66 inches in diameter, weighs 64 tons, and is 190 feet high. The view is that looking upward inside the shell**

Upturn by March, Conference View

■ Business will shake off its present slump by next March but will experience future relapses of more serious consequences unless basic conditions are corrected, according to Virgil Jordan, president of the National Industrial Conference board.

Speaking last week before the Chicago Association of Commerce, he stated that "it is fairly easy and safe for a forecaster to guess when and by what devices the current decline will be checked and business brought out of its latest fainting fit for another breathing spell.

"The present relapse in business has been going on since last March, or for about seven months. It has become very severe and has acquired considerable momentum before being officially recognized, but some sort of governmental gestures or political tricks will probably stop it by next March and induce a slow upturn thereafter.

Recovery Is Too Slow

"'The decline will doubtless be checked before business activity reaches anywhere near the 1932 lows, and perhaps by the end of next year business may be back where it was at the end of this year.

"But this is not as happy a thought as it sounds. It is important to bear in mind the basic fact that by next summer nine years will have passed since the 1929 peak of business, and six years since the low point of the depression. Never before in the recorded history of business in this country has there been a period of as much as six years without a net gain between the beginning and the end in the volume of production and trade.

"Nine years after the beginning of this depression we shall still be far below predepression levels of production and trade, and with a population seven million larger. We shall be six years from the bottom of the depression and not yet have returned to normal business levels, or even to the point where we started. This is unprecedented in America.

"This depression has already far exceeded in length any in the record of this country. Practically every other people in the world has reached or far surpassed its predepression levels of production and trade.

"It is now beyond all question that bare recovery, to say nothing of normal economic progress, has been retarded to an extreme degree by underlying conditions in this

country. After the expected governmental stimulants are applied to check the present relapse, business will doubtless struggle to its feet again and make another attempt to recover. The current sinking spell may not be the final warning to the country that these conditions must be corrected.

"Political devices may bring us out of such tailspins several times more, as they probably will this time; but unless the basic conditions are corrected soon the structure of private enterprise in this country will collapse."

Associates of the conference board held their two hundredth meeting in Chicago, Nov. 17-18. Mr. Jordan's talk was no part of the meeting, but was the high spot of the board's pronouncement on the business situation.

MEETINGS

SCRAP MEETING JAN. 12-14; NEW HIGH IN MEMBERSHIP

■ Forty new members were added to the rolls of the Institute of Scrap Iron and Steel in September and October, it was announced last week. It was stated that the institute has already exceeded all previous records of enrollment and that total membership will reach a new high at its tenth annual convention in Atlantic City, N. J., Jan. 12-14.

WILL ADDRESS ENGINEERS ON LABOR RELATIONS

George E. Sokolsky, author and lecturer, will address the Association of Iron and Steel Engineers at the William Penn hotel, Pittsburgh, Nov. 26. He will discuss "Economic Trend and Management's Job in Bringing About and Maintaining Satisfactory Employer-Employe Relations."

ENGINEERING COUNCIL TO MEET IN WASHINGTON

■ Eighteenth annual assembly of the American Engineering council and the eighth annual conference of secretaries of engineering associations will be held at Hotel Mayflower, Washington, Jan. 13-15. A number of problems of common concern to the engineering and allied technical professions are being considered by committees, and the programs, which include the all-engineers' dinner, are expected to be of unusual interest.

Foundry Equipment Sales Decline in October

■ Foundry equipment orders in October fell below those of September, according to statistics of the Foundry Equipment Manufacturers' association, Cleveland. The net orders index for October was 186.2, compared with 231.8 in September, and 173.8 in October, 1936.

Shipments held fairly steady at 232.3 in October, against 235.4 in September and 162.9 in October, 1936. Unfilled orders index dropped to 309.3 from 347.5 in September.

The three-months average of gross orders was 224.6 in October, compared with 231.2 in September and 160.4 in October, 1936.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Nov. 20	Change	Same week 1936	Same week 1935
Pittsburgh ..	36	+4	67	46
Chicago	27.5	—7.5	76.5	61
Eastern Pa...	35	—3	48	39
Youngstown..	42	—1	73	56
Wheeling	43	—11	89	78
Cleveland ...	15	—20	79.5	80
Buffalo	28	—4.5	84	37
Birmingham .	54	None	74	46.5
New England	30	None	73	93
Cincinnati ...	25	+10	96	†
St. Louis.....	15	—18	68	†
Detroit	71	—11	100	94
Average....	35	—4	74.5	54.5

†Not reported.

FINANCIAL

■ Directors of Continental Can Co. Inc., New York, declared the initial quarterly dividend of $1.12½ per share on the $4.50 cumulative preferred stock, payable Jan. 1, 1938 to holders of record Dec. 10, 1937.

Monarch Machine Tool Co., Sydney, O., has declared an extra dividend of 65 cents and a regular quarterly dividend of 25 cents a share on common stock, both payable Dec. 1 to record of Nov. 23. An extra of 15 cents was paid Sept. 1.

Blaw-Knox Co., Pittsburgh, declared a dividend of 50 cents per share on the outstanding no par capital stock, payable Dec. 20 to record of Nov. 26. The total this year including the latest dividend, is $1.20. In 1936 dividends totaled 80 cents.

Continental Steel Corp., Kokomo, Ind., has declared the regular quarterly dividend of 25 cents on common, payable Jan. 1 to record of Dec. 15. Directors will meet early in December to consider the matter of an extra common dividend.

Holders of a majority of convertible $5 preferred stock of Sharon Steel Corp., Sharon, Pa. have authorized directors to issue before Jan. 1 up to 8000 shares as a dividend on common stock if directors consider it advisable.

PRODUCTION

■ While most steelmaking centers operated last week at a lower rate than previously, Pittsburgh district increased production 4 points to 36 per cent of capacity. The net result of the various adjustments has been to lower the national operating rate 4 points, to 35 per cent of capacity.

Cleveland — Down 20 points to 15 per cent of capacity, as National Tube Co., Lorain, O., took off five open hearths to operate 6 out of 11. This leaves only six out of 39 open hearths active and brings the operating rate to the lowest point since Sept. 1, 1934.

Youngstown, O. — Down 1 point to 42 per cent of capacity with 39 open hearths and two bessemers active. The schedule for next week is about 38 per cent with three less open hearths active.

Pittsburgh—Up 4 points to 36 per cent as a result of order accumulations. The leading producer last week was operating ten blast furnaces in the immediate district, with three others banked, making 13 available.

Chicago—Declined 7½ points to 27½ per cent, a new three-year low. One mill will add three open hearths this week, necessitated by an accumulation of orders. Banking of three more blast furnaces reduces the number of active stacks to 16 out of 39.

New England—Unchanged at 30 per cent of capacity for the third week. A few points may be lost this week, one steel works scheduling ingot operations 10 points lower, with others unchanged.

Central eastern seaboard—Down three points to 35 per cent. Two independent mills are down to one furnace each, although the Pencoyd interest has increased to four.

Wheeling—Operations are down 11 points to 43 per cent.

St. Louis—Down 18 points to 15 per cent of capacity, seven open hearths being dropped.

Detroit—Down 11 points to 71 per cent, with 15 open hearths melting.

Birmingham, Ala.—Unchanged at 54 per cent of capacity.

Cincinnati—Increased 10 points to 25 per cent. One interest restored six open hearths after idleness of a week. Another producer has taken off three furnaces but will resume with four this week.

Buffalo—Down 4½ points to 28 per cent as one open hearth was taken off.

Warehouses Adjust Methods To Satisfy More Exacting Demand

NEW YORK

■ NEW steels and better understanding of their applications have brought about numerous changes in warehousing methods. Lower mill costs have resulted in lower selling prices, so that jobbers can afford to stock them and help increase distribution.

Buyers have been encouraged to become increasingly exacting in their demands for machineability, saving in weight, corrosion and wear resistance, tolerance, finish, and the like. The result has been a marked shifting in the popularity of numerous steel items in warehouse stocks.

All this has presented many complications for the distributor, who has to weigh the extent and momentum of these trends, to keep stocks adequate, yet not burdensome; who has to study the requirements in his district and contribute his share, along with the mills, in promoting new products.

In view of the specialized nature of many present-day demands the distributor is called upon to maintain expensive stocks; highly accurate cutting equipment, such as special hack and cold saws; temperature controlled storage facilities in many cases—to avoid sudden change—and, of particular importance, sales and engineering specialists.

It requires a keen sense of merchandising, a study of trends and conditions, and sound pricing methods to keep stocks moving freely and profitably. Service and sales promotional work are essential. Incidentally this is typified by the recently announced "certified" plan of one large distributor, in providing analysis and heat treatment characteristics of alloy steels with each order purchased.

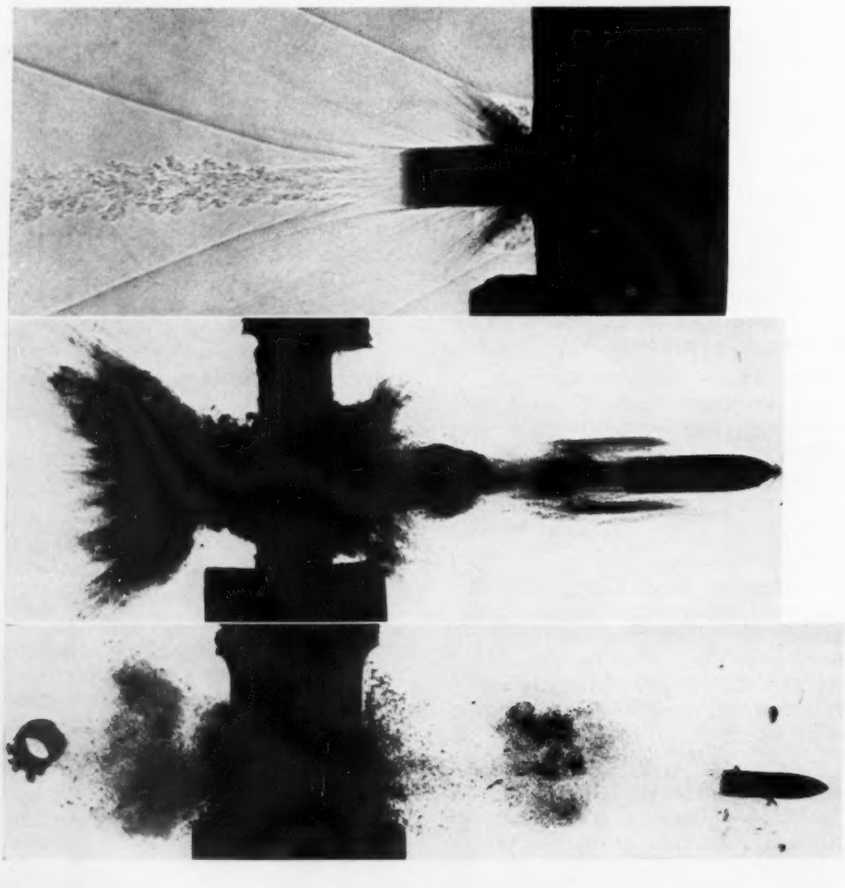
The trend started more than a score of years ago with the commercial development of alloy steels, under the spur of automotive requirements. Twenty years ago leading jobbers carried only one grade of heat-treated alloys and a very limited range in the as-rolled condition. Today the list of classifications carried by some distributors fills a small book.

A few years later, along with alloys, came stainless steel and a new and definite trend became apparent, one which supplemented alloys, but in many cases at the expense of old forms of steel and other materials competitive with steel. So pronounced became this trend that even during the depression, demand for stainless steel sheets, plates and round and flat bars showed a continuous increase from year to year. Now light gage tubing is becoming an increasingly important item in warehouse stainless stocks.

Demand for kitchen equipment, especially for restaurants and hospitals, has led the way, but commercial uses for stainless are increasing, notably in the chemical and textile industries. Each year witnesses increasing requirements from the dairy industry, for utensils and sanitary piping. Architectural requirements, while undergoing some expansion, still represent a light portion of the stainless steel purchased from warehouse.

Flat stainless bars, relatively, have shown quite a spurt, with considerable going into metal furni-

When a Bullet "Punches" Steel



■ These recent photographs from France—taken by spark photography in the laboratory of the French National Office of Research and Invention—show the passage of a bullet through steel plate.

Both the punching action of the projectile and the air wave caused by the nose of the bullet are clearly discernible.

"Concerning the velocity factor," says *Army Ordnance*, Washington, through whose courtesy the photographs are reproduced, "experiments have indicated that for a given plate and bullet there is a critical velocity at which the bullet will penetrate regardless of whether it be of the armor-piercing or generally standard ball type.

"It is probable that this critical velocity is that at which the potential energy of the bullet is sufficient on striking the plate to set up a shearing stress therein in excess of the strength of the plate material in shear.

"The action of the bullet is then similar to that of the punch in the punch press, and a piece of plate is 'punched out' just as a piece of paper is punched out of a ticket by a train conductor. . . Results of experimental firing indicate the probability that this is true."

ture. Round bars, however, continue well in the lead. In shapes, angles are about the only item now furnished in stainless steel from warehouse.

The 18-8 metal still constitutes the great bulk of the business in stainless steel. Some jobbers claim it represents 75 per cent of their total.

About the same time as stainless steel—12 years or so ago—the continuous mill appeared, turning out open-hearth steel sheets and strip in a large range of sizes, beautifully finished and rolled to close tolerances. This not only began to change buying habits, but, along with alloys and stainless, to promote new uses for steel, a fact reflected in the day-to-day listing of orders by distributors.

In response to demand for corrosion resistant steels came various specialties which have enjoyed a steady growth, such as Armco and Toncan metal; galvannealed sheets, with their ability to retain paint; and copper bearing plates and sheets, both black and galvanized.

Then lately there have been the high tensile, low alloy groups—steels confined largely so far to sheets and plates, but with developments expected in bars and structurals.

Widen Cold Finished Range

In cold finished steel, the demand for accuracy is reflected in such relatively new classifications, as the SAE 1040 and 1300 series. Cold finished flats are carried by distributors in a much broader range of thicker and wider sizes, particularly to meet the requirements of machinery builders.

Steels for faster machining are in constant demand and screw stock such as SAE X1112, with its high phosphorus and sulphur ranges, has been moving especially well. High manganese steels have long been in increasing use for case hardening.

Cold drawn seamless mechanical tubing is in broadening and highly diversified demand. Literally, it goes into the manufacture of hundreds of products, and is an item which lends itself readily to bending, without cracking. Welded tubing, generally speaking, is less able to withstand this stress, but costs less and has many uses.

The whole boiler supply line, jobbers report, has lost much of its original importance due to the increasing reliance of manufacturers on central heating units. One large distributing interest which started originally as a boiler supply house now carries only a relatively limited line of these items.

Warehouse demand for structurals and standard plates is down sharply, especially in the East, where there is a heavy mill capacity in these products and more mill competition. Wide flange beams, however, are moving better than standard sections, some jobbers report. Perhaps this is more noticeable in the East where the wide flange shapes were first produced and have long dominated structural output.

Plain carbon bars have not been affected so much as plates and shapes, by the slump in the heavy industries, distributors say. Their answer to that is that bars go into a much greater diversity of uses—uses that take them into the consumer goods as well as heavy lines. Despite the inroads of special steels, plain carbon bars still are reported to be the principal bar item. Some resellers, who carry a range of specifications in stock, estimate that at least 75 to 80 per cent of their bar business is in the plain carbon grades.

Cold rolled strip steel of various finishes and tempers constitute another specialty for which a growing demand has been experienced.

Proposes Ban on Steel Exports for War Purposes

■ Another bill to restrict exports was introduced in the house last week, by Representative Boren, Oklahoma. It provides "that in the interest of the national defense of the United States it is hereby declared to be unlawful to export scrap iron, scrap steel, pig iron, iron ore and finished steel to any nation at war or to any nation, firm, individual or corporation when such is to be used for military purposes."

The bill was referred to the house military affairs committee.

Special Exhibit on Stainless Steel Opens

■ A special exhibit on stainless steel is being held at the Museum of Science and Industry, Rockefeller Center, New York, sponsored jointly by the museum and the Electro Metallurgical Co.

New in concept, interesting in execution and complete in detail, the exhibit has a real story for layman and technician. Special sections are devoted to manufacture, fabrication and uses.

Second Ore Carrier Launched Nov. 20

■ The RALPH H. WATSON, second of the Pittsburgh Steamship Co.'s four new ore carriers, was launched at River Rouge, Mich., Nov. 20. It was the first freighter to slide down the ways at the Great Lakes Engineering Co. since 1930.

The WATSON, named for the vice president in charge of operations, United States Steel Corp., parent of the steamship company, is a sister ship of the WILLIAM A. IRVIN which was launched in Lorain, O., Nov. 10 and is fundamentally the same as the latter vessel in construction and equipment. Two other vessels, the GOVERNOR MILLER and the JOHN HULST, are to be launched in December.

Sponsor of the WATSON was Miss Margaret Merrill, niece of Mr. Watson.

Tungsten Ore Output Gains

■ Despite continued dullness in demand, an increase is noted this month in production of domestic scheelite. This is due principally to operations by two new companies, the Tungsten Corp. of California having just put into operation a 100-ton mill near Bishop, Calif., and the Nevada Tungsten Corp., a 50-ton mill at Gardnersville, Nev. Further, the Tungsten Metals Corp., Kimberly, Nev., is enlarging its facilities which were installed only last summer.

In 1936 approximately 35 to 40 per cent of the tungsten ore consumed in this country, it is estimated, was mined by American producers. This year, however, due to extraordinarily heavy consumption, the proportion has dropped to 20 to 25 per cent.

Next year requirements probably will be supplied in substantially larger percentage by domestic producers. As long as the price does not drop too much under the equivalent of $20, duty paid per short ton unit, domestic production will go ahead in good volume, it is believed.

The market at present is sagging, now about $24, duty paid, as compared with a nominal high about $35 late in the summer. Prospects for next year, however, are considered sufficiently promising to sustain the market at an average which will encourage domestic production.

Hold Housing Conference

■ More than 250 construction industries representatives last week attended the housing conference sponsored by the chamber of commerce of the United States in Washington.

During the two-day session a warning was issued against enactment of the wage-hour legislation.

MEN OF INDUSTRY

■ JOHN F. MILLER, Pittsburgh, has been named chairman of the Pittsburgh Screw & Bolt Corp., Pittsburgh, succeeding the late William G. Costin. Mr. Miller was vice chairman of the board for many years and is also vice chairman of Westinghouse Air Brake Co.

John M. Yahres, who has served with the corporation more than 20 years, has been made executive vice president.

John M. Auty has been made treasurer. Mr. Auty has been with the Screw & Bolt corporation about 15 years.

♦

John U. Anderson, prominent for years in the iron and steel industry in the Youngstown-Cleveland districts, has been elected secretary treasurer, Pittsburgh Steel Co., Pittsburgh. Mr. Anderson was treasurer of Trumbull Steel Co., Warren, O., from 1918 to 1928 when Trumbull Steel was taken over by Republic Iron & Steel Co. He then became treasurer of Republic Iron & Steel and when Republic Steel Corp. was formed he was named its first treasurer, retiring several years ago.

John U. Anderson

♦

G. A. Tompson has been named executive vice president and general manager, Bethlehem Supply Corp., subsidiary of Bethlehem Steel Corp., with headquarters at Tulsa, Okla. Mr. Tompson succeeds H. P. Taubman, who has resigned, effective Dec. 1. Associated with the Bethlehem Supply Corp. as vice president in charge of sales, Mr. Tompson has been engaged in the oil supply business for 20 years.

♦

R. J. Reed, associated with the Titusville Iron Works division of Struthers Wells-Titusville Corp., Titusville, Pa., for more than ten years, has been named manager of that division. Mr. Reed has been succeeded in his previous position as sales manager by Douglas E. Penning.

R. J. Reed

♦

Dr. George B. Waterhouse, professor of metallurgical production, Massachusetts Institute of Technology, Cambridge, Mass., has been awarded the honorary degree of doctor of metallurgy by the University of Sheffield, in recognition of distinguished work in iron and steel research. The degree, awarded *in absentia* at a recent congregation of the college, will be forwarded to Dr. Waterhouse who was unable to be in England.

♦

Frank W. Jones was re-elected president and elected treasurer, Hanover Wire Cloth Co., Hanover, Pa., at a meeting of company directors Nov. 3. P. H. Glatfelter was elected vice president and D. G. Moule was re-elected secretary.

♦

James R. White has been elected president, Rickard & Co. Inc., New York. Other officers elected are: First vice president, Howard L. Fisher; vice president, Edwin C. Mayer; treasurer and general manager, Julian Gran; secretary, Louise F. Maher.

♦

Murray B. Wilson, associated with American Rolling Mill Co., Middletown, O., since 1923, has been named manager of the New York sales district. Following graduation from Miami university, Mr. Wilson started as a mill worker at Armco's Middletown plant. He later was assigned to the home office sales division, and since 1927 had been attached to the Detroit sales district office. He succeeds Cliff Spear, who has been forced to curtail his activities because of ill health.

♦

A. T. Hatch has been elected president and general manager, Davenport Machine Tool Co. Inc., Rochester, N. Y., succeeding the late William S. Davenport. Mr. Hatch has been associated with the firm since its incorporation in 1919 as secretary-treasurer and assistant to Mr. Davenport.

C. R. Burt, one of the original incorporators of the Davenport company and now president, Niles Bement-Pond Co., will continue as vice president and chairman of the board of the Davenport company. C. W. McKay, second vice president and also one of the original incorporators, will continue to serve as the company's legal advisor. R. M. Whitney, auditor for the past 15 years, has been elected secretary-treasurer. F. G. Silva, superintendent, and E. W. Brinkman, identified with the machine operating and sales engineering divisions of the company, have been elected directors, to fill the vacancies caused by the death of Mr. Davenport and the resignation of Edith E. Davenport.

♦

Miles C. Smith, in charge of sales and marketing of Colmonoy products for the past several years, has resigned from Colmonoy Inc., to direct sales promotion and sales of Amercoat, a new corrosion-resistant sprayable plastic that has been under test in the laboratory of American Concrete & Steel Pipe Co., Los Angeles.

♦

Theodore Trecker, president, Kearney & Trecker Co., Milwaukee, maker of milling machines, gave a dinner at the Elks club in Milwaukee, Nov. 6 in commemoration of his fiftieth anniversary in the machinery business. Guests were the 60 members of the Oldtimers' club, with the firm from 20 to 35 years, and 92 apprentices in the shop. Mr.

Murray B. Wilson

Trecker started work as a machinist apprentice on Nov. 7, 1887. In 1898, with the late Edward J. Kearney, Mr. Trecker formed Kearney & Trecker Co. The plant now employs nearly 1400 persons.

♦

H. H. Ziesing, sales manager, The Midvale Co., was elected president of the Steel Club of Philadelphia at the November meeting. H. W. Merriman, Philadelphia district manager, Alan Wood Steel Co., Conshohocken, Pa., was named vice president and F. L. Shants, Philadelphia district manager, Lukens Steel Co., Coatesville, Pa., secretary-treasurer. C. H. Stoeckle and H. E. Richardson, Philadelphia district managers, respectively, for the Crucible Steel Co. of America, New York, and the Youngstown Sheet & Tube Co., Youngstown, O., were named directors. The two directors and the officers constitute the organization's board of governors.

♦

R. A. Peterson has been appointed superintendent of merchant bar mills, Gary works, Carnegie-Illinois Steel Corp. He left Aetna-Standard Engineering Co., Youngstown, O., in 1934 to join American Steel & Wire Co., Cleveland, as mill adviser, and since May, 1936, has been located at the Gary works of Carnegie-Illinois as assistant superintendent of the merchant, axle and wheel mills.

C. S. Ramsey succeeds Mr. Peterson as assistant superintendent of merchant bar mills. Since 1922 he has been assistant superintendent of merchant mills in charge of rolling. S. R. Stanier, since July, 1936, assistant superintendent of the 38-inch strip mill, has been made superintendent of hot strip mills. R. B. Lucas, associated with Gary works since 1911, has been appointed superintendent of the wheel and axle mills. George Tree, recently assistant superintendent of merchant mills, has been named superintendent of maintenance, west division. S. L. Moffatt has been promoted from assistant superintendent to superintendent of No. 4 open-hearth furnace.

♦

John K. Underwood, heretofore manager of sales, sheet products division, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been promoted to assistant to the general manager of sales. A. R. Baldwin, manager of sales, wire products division, has been made manager of sales of the combined sheet and wire products division.

Mr. Underwood has been associated with the steel industry 27 years, and is widely known in the South. Mr. Baldwin has been with the Tennessee company since 1933, when it purchased the Birmingham operations of the American Steel & Wire Co., and at which time he was assistant sales manager at Birmingham for the latter company.

John K. Underwood

♦

Expansion of executive personnel of Micromatic Hone Corp., Detroit, recently a joint purchaser with Barnes Drill Co., Rockford, Ill., of the Hutto Machine division of Carborundum Co., has been announced.

In co-ordinating Micromatic and Hutto Tool division organizations, Harry M. Whittaker, formerly chief engineer with Micromatic, has been appointed vice president and director of sales; and J. E. Kline, formerly chief engineer, Hutto Tool division, becomes chief engineer in the combined organization.

Other executive personnel appointments are: A. J. Prentice, secretary-treasurer; A. Bleasdale, factory manager; L. S. Martz, advertising and sales promotion manager; N. H. Hubbard, sales manager, tool division; E. L. Gruenberg, sales manager, equipment division; H. L. Harwell, sales manager, abrasives division; J. W. Kinsey, sales manager, export division; L. D. Curtis, purchasing agent. Divisional sales engineering representatives include: Frank J. Jeschke, G. M. Calvert, E. F. Brower, Don S. Connor, B. L. Matthew, E. Hartzell and R. Marah.

A. R. Baldwin

DIED:

■ HOMER D. WILLIAMS, who retired in 1936 as president of Pittsburgh Steel Co., Nov. 13 at the University hospital, Baltimore. Mr. Williams began his career in the steel industry as a carbon boy with Cambria Steel Co. in 1880. Five years later he left to take special courses in chemistry and metallurgy at Lehigh university, following which he became a chemist in Chicago for Illinois Steel Co. In 1899 he took charge of the bessemer converter at the Homestead plant of Carnegie Steel Co., and in 1914 assumed the presidency of Carnegie Steel. After 11 years he resigned to become president of Pittsburgh Steel.

♦

Emanuel Hribal, 73, proprietor, International Foundry, Cleveland, in that city, Nov. 12.

♦

E. J. Poole, 64, vice president and general manager, Carpenter Steel Co., Reading, Pa., in Reading, Nov. 16.

♦

A. N. Myers, 75, first vice president, F. E. Myers & Bros. Co., Ashland, O., manufacturer of pumps and hay tools, in Cleveland, recently.

♦

Elmer Ellsworth, associated with the Standard Tool Co., Cleveland, for more than 50 years, the last 35 as secretary-treasurer, in Cleveland, Nov. 13.

♦

I. H. Barbee, manager of the Atlanta, Ga., plant of Link-Belt Co., Chicago, in Philadelphia, Nov. 4. He served the Link-Belt Co. at its Chicago, Philadelphia and Atlanta plants for a total of about 25 years.

♦

Warren H. Cowdery, 84, cofounder, and president and chairman of the board for many years, American Fork & Hoe Co., Cleveland, at his home in Pasadena, Calif., Nov. 13, to which he retired in 1930. He began his career with the Geneva Tool Co., and later helped organize the Ashtabula Tool Co., both plants becoming part of the American Fork & Hoe Co., formed in 1902.

♦

Charles C. Cluff, 74, more than 50 years in the steel business when he retired in 1932 as New York district manager of sales for the Carnegie and Illinois Steel companies and Tennessee Coal Iron & Railroad Co., and the last of the three legal incorporators of the United States Steel Corp., Nov. 13, in New York. Mr. Cluff entered the steel industry in the New York offices of the Illinois Barbed Wire Co. in 1881, and 14 years later became general eastern sales agent of the Illinois company, the position he held when the Steel Corporation was formed.

Activities of Steel Users and Makers

■ REGAL ENGINE CO., Coldwater, Mich., has purchased the assets of the Esco Engineering Service Co., manufacturer of a special type of jigs and tools used extensively by all large manufacturers of metal products. It also has purchased the machine shop and equipment of Edward Roberts, who has been operating his company in connection with the Homer Furnace & Foundry Co. The new company will be known as Regal Mfg. Co. and all manufacturing will be carried on in Coldwater. Esco Engineering Service Co. will retain its identity as a division of Regal, with sales and engineering offices at 1010 Beaubien avenue, Detroit. New officers are W. J. Carlisle, president; Robert W. Allen, vice president and secretary; Francis J. McGarry, vice president in charge of sales; Frederick M. Ross, vice president and chief engineer, and John N. Hardy, treasurer.

♦

Dearth Diehl & Co. Inc., Cincinnati, has been appointed distributor for Globe Stainless Tube Co., Milwaukee.

♦

Warren Iron & Metal Co., Detroit, has removed its offices and yard to 12455 Greenfield road, north of Plymouth road.

♦

Wesley Steel Treating Co., 1333 West Pierce street, Milwaukee, has established a branch plant in Green Bay, Wis., to serve northeastern Wisconsin industries.

♦

American Flexible Coupling Co., Erie, Pa., has moved to new and larger quarters at Eighteenth and Pittsburgh avenues, and is now able to handle greatly increased capacity.

♦

Perth Amboy Dry Dock Co., Perth Amboy, N. J., has completed installation of additional equipment which will enable it to fabricate steel plates of heavy gages.

♦

SKF Steels Inc., New York, has opened at 110 Frelinghuysen avenue, Newark, N. J., its principal warehouse in which will be stored a complete stock of tool steels and chrome steel tubing and bars.

♦

Roth Welding Engineering Co., 13440 Klinger street, Detroit, has moved into new and larger quarters at 17146 Mount Elliott avenue. Additional office and manufacturing space will be available. H. W. Roth is president.

♦

Kelvinator division, Nash-Kelvinator Corp., Detroit, has established a new apartment house department to handle the merchandising of Kelvinator household appliances. John J. Massimi has been appointed manager of the department.

♦

Harnischfeger Corp., Milwaukee, recently booked an order for its 10,000th electrical traveling crane, a 40-ton unit, for delivery to the Indiana Harbor, Ind., plant of Inland Steel Co., upon its completion in February, 1938.

♦

Lincoln Electric Co., Cleveland, has opened a new sales office in Phoenix, Ariz., in charge of R. J. Reardon. For the past six years Mr. Reardon has been with the American Metal Products Co., Detroit, as welding engineer and supervisor.

♦

An increase in size of shipments is reported by the Haslett Chute & Conveyor Co., Oaks, Pa. Recent orders included the Williamsburg Inn at Williamsburg, Va., the town being remodeled by Rockefeller interests, the Welfare Island hospital, Welfare Island, N. Y., Furniture Mart, San Francisco, and the Pilgrim hospital, Brentwood, L. I.

♦

Stewart-Warner Corp., Chicago, will transfer its refrigerator manufacturing operations from that city to Indianapolis, where a new plant has been acquired from the trustees of the Marmon Motor Car Corp. Plant capacity at Chicago has been inadequate for some time. About 600 workers are employed in the refrigerator division.

♦

A film suitable for technical or semi-technical meetings entitled "Building the World's Largest Precision Instrument," describing the story of fabricating the mounting of the Mount Palomar 200-inch telescope is available through district offices of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The film is 16 m.m., silent, 400 feet long.

♦

Four departments, comprising purchases, sales, statistics and advertising, in the executive offices of Nash Motors at Kenosha, Wis., are being transferred to the executive offices of the Kelvinator division of Nash-Kelvinator Corp., Detroit. Harold E. Long, vice president in charge of purchases, already has moved to Detroit, and representatives of the other three divisions will arrive before Jan. 1.

♦

Peerless Steel Products Co. Inc., 17385 Ryan road, Detroit, is transferring its activities to a portion of the former Rickenbacker plant, 4201 Cabot avenue, occupying 22,000 square feet of space, and installing a considerable amount of new equipment including cranes, shears, roller levelers and slitters. The company does a warehouse business in sheets and strip, and handles some plate. The new location will provide about three times the present space. It is now occupied by the Production Steel Co., which is moving into the former plant of Columbia Motors Co., Beaufait and Gratiot avenues.

New Irvin Works Grows Rapidly

■ **Rapid progress in the new Irvin works of Carnegie-Illinois Steel Corp., near Pittsburgh, is shown by this aerial view taken Nov. 6, less than six months after construction was started. The plant is located on a plateau 220 feet above the level of the Monongahela river**

"Life, Liberty And"—Machinery

■ Increases in employment and wages, in goods and services available to all and wider opportunities in skilled trades and professions have resulted from modern machinery, says the National Machine Tool Builders association in its new booklet, "Life, Liberty and the Pursuit of Happiness."

Better products can be obtained at lower cost, the pamphlet says in outlining improvements in home, office, factory, store and transportation equipment.

"Less than a dozen years ago when only about 200,000 domestic refrigerators were produced in a year, the average price was $400. When modern methods raised production to 2,000,000 a year, the average price dropped to $163.

"In 1921 a washing machine cost $142.85. The 1937 washer, better made, can be bought for $64.50.

"Today's efficient radio equipped for foreign and domestic broadcasts, affording selectivity and modulation of tone, costs as low as $19.95." In 1924 a comparable set cost approximately $200.

Development of the automobile by use of modern machine tools has resulted in greatly increased employment and wages. "In 1909 the average wage in the automobile industry was 25 cents an hour; today it is 80 cents an hour. Only 100,000 cars were built and about 80,000 persons employed in their manufacture. Today 4,000,000 cars are produced in a year and 400,000 persons are employed."

Factories also reflect the gains due to better machinery, says the association. They are safer places of employment, cleaner, better lighted and better ventilated than a few years ago. Through the increased efficiency gained by more productive equipment, better materials and improved methods the workmen earn higher wages for fewer hours.

Koppers To Build 15 New Ovens for Armco

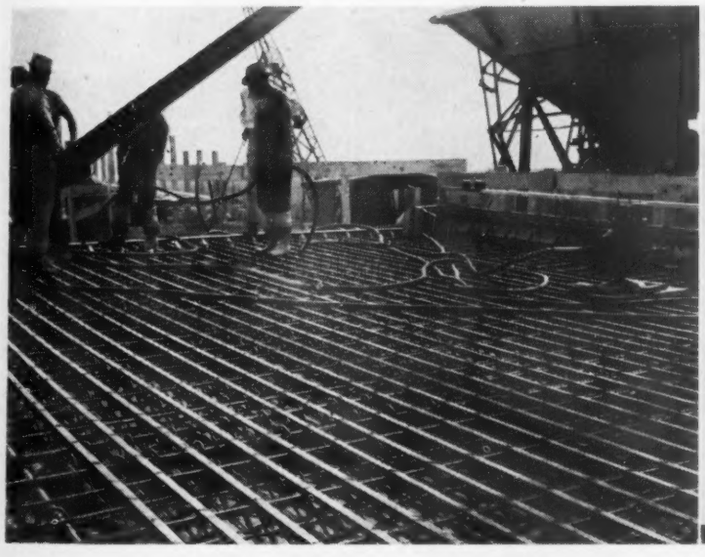
■ Calvin Verity, vice president, American Rolling Mill Co., last week announced 15 new coke ovens will be built at the company's blast furnaces in Hamilton, O., at an estimated cost of $500,000.

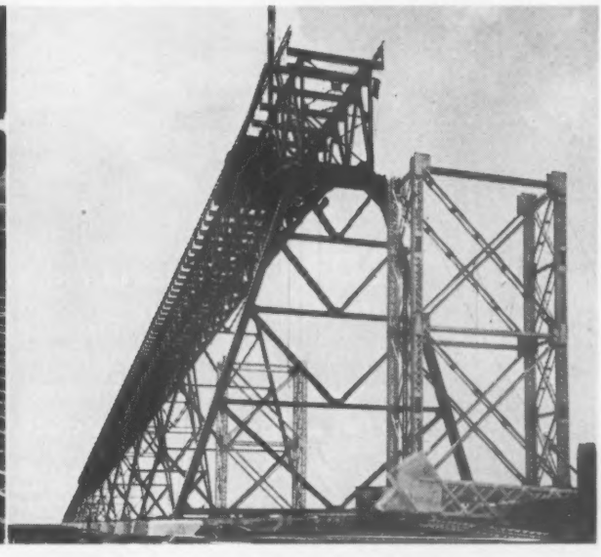
Koppers Co., Pittsburgh, has been awarded the contract. Construction work, which will require about ten months, will start immediately. The new ovens will be Becker low-differential, under-jet type, each oven chamber to hold 15 tons of coal.

The company already operates 45 coke ovens. The new ovens will make possible more economical operation of its two blast furnaces.

Since the company purchased complete ownership of the Hamilton Coke & Iron Co. in August, 1936, a blast furnace has been built and many other improvements made, costing more than $1,750,000. This is equal to an additional investment of $5000 per employe.

South's Highest Bridge Features New Reinforcing Truss





■ Arching high over the Neches river in Texas, the Port Arthur bridge nears completion and is expected to be opened to traffic in March. This $2,750,000 structure, jointly financed by the PWA, the Texas highway department and Jefferson county, will serve the Hug-the-Coast highway and afford a quick modern route into Port Arthur from the towns to the north.

Fabrication of the bridge requires 9285 tons of structural steel and 1906 tons of reinforcing. Seven hundred tons of the reinforcing steel is Jaltruss, a concrete reinforcing section recently developed by Jones & Laughlin Steel Corp., Pittsburgh. These sections in place are shown at the left in the accompanying photo.

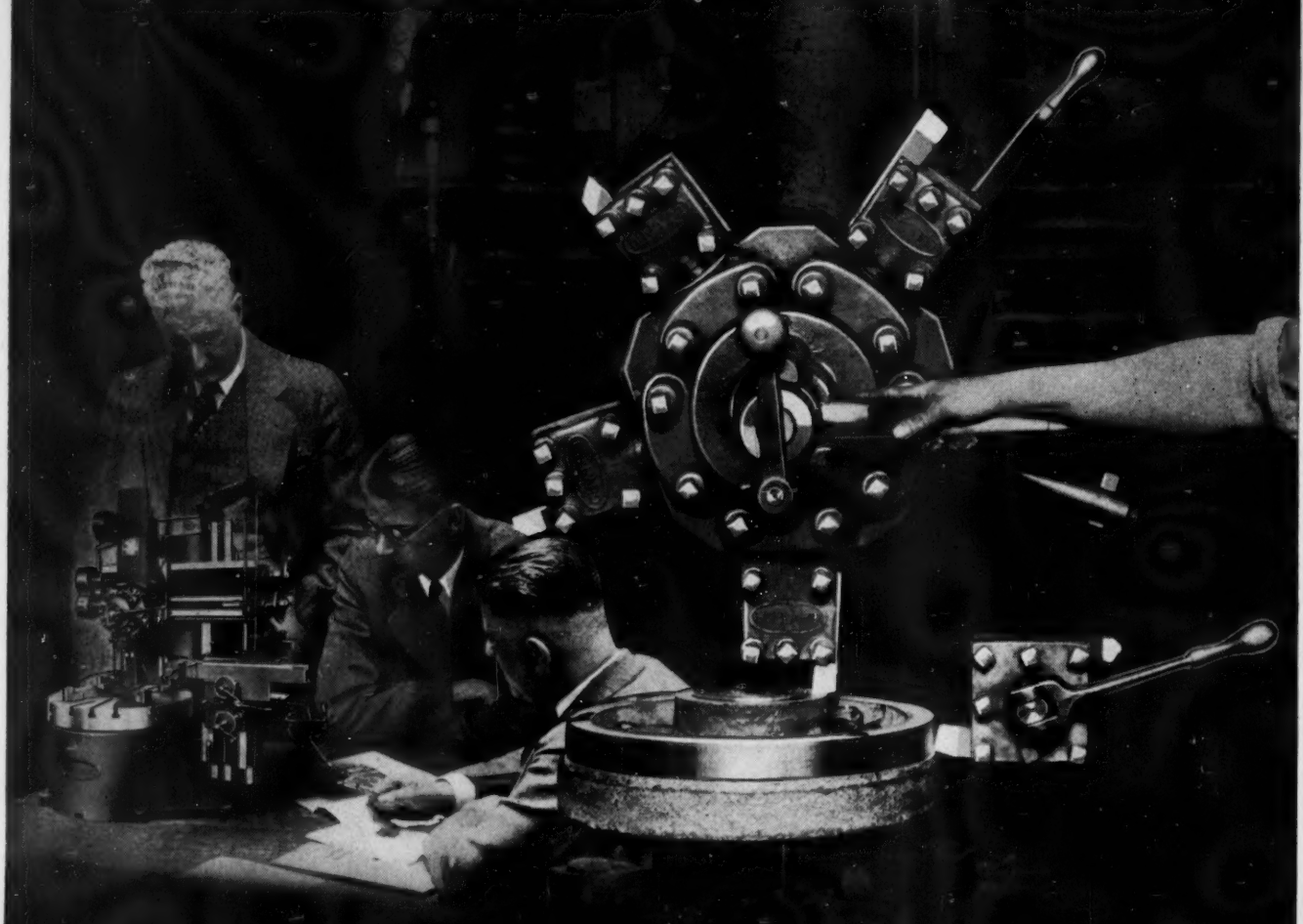
Jaltruss is a simple steel section of double Warren truss design, rolled into shape in one continuous operation on a nine-stand tandem rolling mill, and is especially designed for floors of bridges and other structures subject to severe forces and stresses caused by heavy moving loads. Four of the ten sizes in which the section is made are being utilized for longitudinal and transverse reinforcement in the Port Arthur bridge floor.

The bridge, including approaches, one of which is shown at right in photo, will be 5.7 miles long. The main span will be 1.5 miles long and will run well back into the marshlands that lie on either side of the river.

Highest bridge in the South, it reaches an extreme height of 230 feet and has a vertical clearance of 176 feet, more than sufficient to allow passage of ocean vessels. Only five other bridges in the United States exceed it in height.

Ash-Howard-Needles & Tammen, consulting engineers of New York and Kansas City, Mo., designed the structure. Taylor-Fichter Steel Construction Co., New York, are the contractors.

PLANNED PROFITS



TODAY, the Aim of Industry is toward Planned Profits instead of Haphazard Profits.

Bullard Engineering Service has in many instances assisted in planning ways and means toward Profits, and Bullard Vertical Turret Lathes have produced the Planned Profits.

For instance, in one case a 42-inch Vertical Turret Lathe cut time from 9 hours to 2 hours. In another case, the previous time was 26.0 minutes. Bullard time, using modern type cutting tools, is now 11-¾ minutes. Still a third case showed the best previous time for a bronze worm gear blank was 12 minutes. Planned tooling of a Bullard Vertical Turret Lathe reduced the time to 3 minutes.

These are only a FEW cases of Planned Profits.

If others can Profit, so can You.

Send your prints or samples to Bullard for Estimates. Let us plan your Profits on those problem jobs.

THE BULLARD COMPANY

BRIDGEPORT • CONNECTICUT

MIRRORS OF MOTORDOM

BY A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ HUNTERS returning from Pursuit of the wandering deer in northern Michigan say the weather prophets up there are forecasting a hard winter, after carefully noting advance preparations of all nature's little creatures. Here in Detroit the industrial weather prophets check with veteran woodsmen on the outlook, but most observers of the current toboggan in business can see the sunshine over the hill, though it may be February before the hill is climbed.

Speaking automotive-wise the picture today appears exactly the reverse of 12 months ago. Then the demand for new cars was torrential, order books were crammed and production lines were far behind. Today production, while still strong, is a few laps ahead of demand; and is now being whittled down more closely to the level of demand.

Production Schedules Trimmed

A comparison of production figures for October, 1936, and October of this year—230,049 versus about 350,000—on the surface might be taken as indicating a more favorable condition this year. But remember production of 1938 models started earlier, and that preliminary schedules were set up on a much higher plane than last year. November production figures will show a decline from the total of last year—anywhere from 50,000 to 75,000—and schedules for December are now in process of being trimmed further. Briggs, for example, is planning only 14 days of production for December, four days per week, closing down Dec. 23.

The four-day week is spreading throughout production lines and parts plants in this area and is likely to hold until after the holidays. Scattered field reports from some producers are more encouraging, but in general there is no great enthusiasm over sales outlook. Every available inch of storage space is being crammed with new cars; dealers are well stocked, and the flow of new models is gradually backing up to assembly lines.

This may appear to be undue pessimism and to some extent does conflict with statements emanating from automotive sales and publicity offices. Nevertheless the suppliers of materials and parts here, who are as a matter of necessity close to manufacturing departments, practically to a man will check this outlook and in some cases go even further.

■ ANOTHER fly in the ointment is the labor situation which, true to advance predictions, is coming to a head again. Last Monday UAW employes at Fisher Body in Pontiac ceased work, welded plant gates shut and forcibly detained all men in the shift at the plant. There they remained until the next morning when union officials ordered them out. The consequent shutoff of bodies crippled the Pontiac assembly lines and forced a closing there, resulting in lost time for an estimated 10,000 men.

The sitdown, free from any sort of violence, resulted as a protest to the laying off of 500 men the week before, which had been necessitated by curtailed schedules and the fact that this division is no longer making La Salle bodies. The work week had been reduced to 28 hours in an effort to keep as many men at their jobs as possible.

Union Rejects Revised Contract

Production was resumed within 48 hours after a conference had been arranged, but when the management announced it intended to discipline instigators of the strike, men in the Fisher plant again quit and by Thursday morning both Fisher and Pontiac plants were idle with some 17,000 out of work. Company officials said the plants would not reopen before Monday at the earliest.

Wednesday, 75 men in the core room of the foundry at Cadillac quit work in a dispute over wages and in a short time had tied up the entire plant employing about 4000. This strike was short-lived.

Thus chalk up three more "wildcat" strikes in General Motors plants in defiance of the UAW promise to curb such activities.

Public announcement of the revised contract which UAW and General Motors officials had worked out was made last week, practically simultaneously with the union's rejection of its terms. Modifications of the original March 12 agreement were in process of negotiation for more than two months, representing 60 days of an average of four hours negotiation each, and were thought to be acceptable to a majority of the union negotiating committee. But such was not the case.

Grievance Procedure Revised

Comparison of the modified contract with the original reveals extensive clarification of points covering recognition of the UAW and details of grievance procedure. It provides for recognition of UAW members, forbids collection of dues on company property, reserves to management the right to hire, discipline or discharge employes, and rules against all forms of interruption to production.

Shop committees are limited to seven men compared with nine previously. Committeemen are not permitted to receive pay for any time over two hours spent in adjusting grievances.

Rejection of the new agreement by the UAW was reported due primarily to the fact the union was not accorded exclusive bargaining powers for the corporation's employes, no wage increases were mentioned, and seniority was not

MIRRORS OF MOTORDOM

altered to start immediately with employment instead of after six months.

On the heels of the union's rejection action came a statement from President Knudsen of General Motors holding the UAW to its assurances given Sept. 16 against wildcat strikes. In view of developments of the week, however, the union has discarded all responsibility for such strikes.

Over at Chrysler, the UAW evidently used a little "persuasion" in obtaining the resignation of three officials of the Independent Chrysler Employes association who early in the week gave out statements to the press and posed for pictures with UAW officials as they renounced their association with the independent group. Obviously staged for the benefit of Chrysler employes not already members of the UAW, the action was condemned by the Chrysler organization as "propaganda of the worst kind." Incidentally, the three men in question refused to give any comment to newspaper reporters on the advice of UAW counsel. The UAW now has a case on file with the national labor relations board against Chrysler, and the three men will be produced as witnesses if a hearing is ordered.

The UAW wants elections in both General Motors and Chrysler plants to be held by the labor board, as a means to obtain exclusive bargaining rights, but it appears questionable whether the labor board has sufficient funds left in its budget to supervise such elections in the far-flung plants of these two corporations.

■ HUPMOBILE officials wish now they had been able to bring out their new model about 12 months sooner, feeling they have missed the sales boat by just about that margin. Although the plant is turning out about 150 cars per week, it required a superhuman effort on the part of the management to hold several distributors when the original prices on the new lines were announced. A "readjustment" of about $150 kept them in line, however, and the company is hoping for the best. The new Hupp is conservative in appearance and is banking largely on former Hupp owners to come through with repeat orders.

Excepting Graham and Lincoln-Zephyr, the industry's offerings for 1938 all are on the conservative side, which may be one reason why tool and die shops are confidently expecting a banner year when the 1939 models begin to take form. Some of the larger die shops in this district have been expecting momentarily some feelers on dies for 1939, but as yet no inquiries have appeared, with the result die shops are now at low ebb of activity. One of the large die suppliers here, ordinarily employing several hundred, now has no more than a dozen men in the shop.

Equipment interests likewise are hoping for some windfalls in connection with 1939 models. Although business now on the books will keep builders' plants going until February at least in many cases, new orders are practically at a standstill. Machinery people have no kick on this year's business with the automobile industry, however, in view of the many new plant projects which were started and extensive re-equipping instituted in present plants.

Dodge and Plymouth are being tipped off as good bets for new equipment programs during the coming year. And should one large builder go through with reported plans to shift to a V-8 engine from its present in-line design, a capital expenditure of several millions is indicated.

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
Sept.	92,728	139,820	175,620
9 mos.	3,012,628	3,461,468	3,955,013
Oct.	280,316	230,049	*352,565
Nov.	408,550	405,799	.....
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended:	
Oct. 23	91,905
Oct. 30	90,155
Nov. 6	89,770
Nov. 13	85,325
Nov. 20	85,757

	Week ending Nov. 20	Nov. 13
General Motors	40,900	45,110
Chrysler	26,700	22,100
Ford	3,525	2,650
All others	14,632	15,465

*Estimated.

■ THE Italian-built Fiat (Fee-aht) is reputed to be making a strong bid for some American business with its small cars exhibited at the New York show. A 13-horsepower coupe model delivers for $599 in New York and boasts a number of radical innovations in design. It has a 4-cylinder engine mounted ahead of the front axle line. Radiator is behind the engine and the fan draws air back over the engine and forces it out through a grille just in front of the windshield, thus bathing the latter in a stream of warm air and preventing fogging. Wheelbase is 78¾ inches; track 3 feet 6 inches. Frame channels are punched to lighten their weight. The car is claimed capable of 60 miles per hour speed with economy of 60 miles per gallon of gasoline.

It remains to be seen whether American buyers will take to such an "overgrown motorcycle," and best guesses heard here are that it will be difficult to put the car across. Experience of bantam cars in this country has not been particularly happy. The innovations in design which the car offers may suggest some ideas to builders in this country.

■ FORD assemblies late last week had increased to 1500 daily after experiencing considerable trouble earlier with dies.

Willys in the past year has made automotive history in the small (though not bantam) car field, and is currently turning out about 1000 cars weekly, although there have been numerous interruptions to production this fall. The 1938 model is practically a duplicate of that offered this year, although there are several mechanical changes in the new model. Willys engines are now being made in Toledo, the large plant operated by Wilson Foundry & Machine Co. in Pontiac now being occupied by General Motors for storage.

The new Chrysler engine plant in Windsor is being given the finishing touches and should be in operation within 30 days. Production here will bring the content of Empire-produced parts in Chrysler assemblies up to the necessary level to avoid heavy duties.

WINDOWS OF WASHINGTON

WASHINGTON

■ THE SECOND session of the present congress got away last week with no apparent desire to hurry with anything, important or not. However, there is nothing unusual in this situation, as it has been the same for many years.

In his message calling the special session, the President hit the king pin by admitting there is a business recession, but after calling attention to this situation he asked for no special consideration or priority for business legislation.

Bertrand N. Snell, New York, minority leader of the house, referred to the message as "a great disappointment." "It reveals clearly," said Snell, "that there has been no change in the fundamental policies and attitude of the New Deal toward business, thrift and investment. The will-o'-the-wisp of government managed economy still stands as the core of the President's empty eloquence. Mr. Roosevelt's vision of the government managing everything is here reaffirmed and enlarged."

In further criticism of the message the minority leader said that "having induced an unnecessary business recession by unsound policies the President now calls upon shackled private enterprise to rescue the administration.

"Business can restore prosperity, and will do so if and when it is freed from the harrassing impediment of Roosevelt policies."

Puts Blame on Business

Said Mr. Roosevelt in his message: "Since your adjournment in August there has been a marked recession in industrial production and industrial purchases following a fairly steady advance for more than four years."

On this same subject he continued: "We have not been unaware of uncertainties in the economic picture. As far back as last spring I called attention to the rapid rise in many prices, a rise that threatened in particular the anticipated revival of building. And over a month ago

BY L. M. LAMM

Washington Editor, STEEL

I quoted one of the country's leading economists to this effect, that the continuance of business recovery in the United States depends far more upon business policies than it does upon anything that may be done, or not done, in Washington.

"The present decline has not reached serious proportions. But it has the effect of decreasing the national income and that is a matter of definite concern."

Recession Can Be Checked

Mr. Roosevelt stated that he had many conferences recently with business and industrial leaders and referring to these said: "But these discussions make it clear that we have enough wisdom in the country today not only to check the present recession but to lay the groundwork for a more permanent recovery. If the people are as willing as government to use the economic knowledge gained in recent years, this recession need go no further.

"With the exercise of ordinary prudence, there is no reason why we should suffer any prolonged recession, let alone any general economic paralysis. Despite some maladjustments, which can be corrected, underlying conditions are not unfavorable."

In dealing with the subject of tax revision, he stated that "in accordance with my suggestions of last spring, committees of the congress, with the co-operation of the treasury department, are already engaged in studies aimed at the elimination of any injustices in our tax laws. Unjust provisions should be removed, provided such removal does not create new injustices. Modifications adequate to encourage productive enterprise, especially for the smaller businesses, must not extend to the point of using the corporate form for the purpose of hiding behind it to reduce or eliminate taxes in a way not open to an individual or partnership." He made a special plea for small business in connection with the tax situation.

The President also urged action on the hours and wages bill. "I believe that the country as a whole," he said, "recognizes the need for immediate congressional action if we are to maintain wage income and the purchasing power of the nation against recessive factors in the general industrial situation. . . . We should provide flexible machinery which will enable industries throughout the country to adjust themselves progressively to better labor conditions. But we must not forget that no policy of flexibility will be practical unless a co-ordinating agency has the obligation of inspection and investigation to ensure the recognition and enforcement of what the law requires."

Rayburn Favors Tax Change

Representative Rayburn, majority leader of the house, discussing the tax situation last week said:

"A great many would rush us into a revision of our tax structure. We have gotten in a great deal of trouble by rushing into tax revisions. I think that a thorough study should be made of our tax structure. I don't think it can be done in a day. . . . I think the inequities and inequalities of the present tax structure, if there are such, should be ironed out, and in the end that we should do justice to all concerned. . . . If little industries are being oppressed by the present excess gain and surplus tax, or big businesses, as far as that is concerned, I think those industries and those businesses should be relieved."

Discussing the question of hours and wages legislation, Mr. Rayburn said: "We hope and trust that we may be able to pass wages and hours legislation at this special session of congress. I am one who believes the time has come when the federal government should and must have a labor policy, and through the pending wages and hours legislation it is our hope to establish a

government policy for labor in enacting wages and hours legislation."

TAX REVISION HAS GOOD SUPPORT IN SENATE

Senator Pat Harrison, Mississippi, one of the influential members of the upper house and chairman of the powerful senate finance committee, came out last week for changes in taxes to help the business situation.

"Changes in our tax system," said the senator, "'should be made that will give encouragement to private industry to expand and increase employment. This is no time to reduce revenues, but it is time to reduce expenditures so that a balanced budget may be attained. I am sure the ways and means committee of the house will bring out a constructive revenue measure, modifying the capital gains and loss provisions of the present law, as well as the undistributed profits tax.

"There has been some talk of replacing the capital stock tax. I dc not believe that is wise at this time, because revenue from that source is 140 million dollars annually. There has been little complaint about this tax. Business is more interested in the capital gains provisions and the undistributed profits tax. Corporations should not be penalized for expanding their profits in prudent enlargement of business and in payment of their debts."

MANUFACTURERS URGE RELIEF FOR INDUSTRY

Easing up in the tax situation and shelving of further plans to restrict industry were urged upon the new session of congress last week by the National Association of Manufacturers through a letter to individual members from William B. Warner, president.

"It is fortunate," said Mr. Warner, "that congress has convened, for it is within its power to apply a remedy at once. It can act immediately upon the whole tax situation."

Of course, this is not in accord with what congressional leaders think. They do not believe that this special session will be able to take up the tax situation, because the house ways and means committee has not gone far enough with its tentative program. However, many members of both houses think the tax situation should be one of the first things solved in spite of the program of the President.

Mr. Warner told the members in his letter that the connection between the present business recession and the effect of laws which hamper the free flow of capital through private enterprise "become plainer every day."

The association made several direct suggestions, one of which is to amend the undistributed profits tax "to make it clear that every dollar spent by American corporations for improvement and expansion, or replacement of plant facilities and equipment, shall be relieved from the penalties of the law."

A further suggestion was the repeal of the combined capital stock and excess profits tax. In a third recommendation the association would modify the capital gains tax "to provide that losses on what is owned can be fully offset against gains," and a fourth suggestion is to "cut the present maximum individual surtax rates by a reasonable percentage that will call discouraged capital into service."

PROMPT FREIGHT RATE ADVANCE NOT LIKELY

The interstate commerce commission has set Nov. 29 for hearings on the 15 per cent freight rate increase asked by railroads in addition to the recent increase allowed on many commodities.

News stories have been going out from Washington to the effect that there will be a quick decision in this latest request for increases by the carriers. This, however, is practically impossible, as shippers who oppose such an increase, and naturally there will be many of them, must be given their day in court. Even if the commission itself wanted to rush a decision in this case, it is practically prohibited from doing it because the law provides for hearings and they must be held. No matter how the commission wants to expedite a case, it is quite impossible because the shippers must be heard. Therefore, it seems probable it will be several months before there could possibly be a decision on this request for a straight 15 per cent increase in freight rates.

LABOR BOARD MEMBER DEFENDS ITS PURPOSES

Whether anyone else has faith in the national labor relations board, Edwin S. Smith, one of its members, believes in it. He said so last week in no uncertain terms in defense of the board, against which there has been so much criticism recently.

In discussing the labor problem, with especial reference to the labor board act, Smith said: "How much labor can accomplish for itself by organizing in the economic and the political field remains to be seen. It has a long way to go to provide for the industrial workers even a minimum of security and decency in our strange world, in which unused capacity to produce and unsatisfied human needs face each other across a void which we lack the intelligence and the courage to bridge.

"I believe firmly in the purposes of the act. I think the board should exercise the utmost diligence in seeing to it that the rights which the act guarantees to labor should be scrupulously maintained."

Smith criticized manufacturers and employers. "Employers," said he, "have by no means given up the fight against organization of labor. Many have shifted their tactics in ways which are not always easy to discover. The board must be on the watch for new legal defenses which mask attempts to evade the act."

JAPANESE RAILROADS TO BUILD 500 LOCOMOTIVES

The Japanese railway ministry's building program, amounting to 100,000,000 yen for the 1937-38 fiscal year, includes construction of 500 locomotives, according to reports published in Tokyo.

The construction program also includes 7000 freight and 200 passenger cars which are said to be needed, due to the congested condition of freight on Japanese railways.

It was reported that railway traffic in Japan has increased to such an extent that revenue from freight on the state railways was more than 14 per cent larger than last year.

Negotiations for iron supplies needed in the program are now under way with the Japan Iron Manufacturing Co., pending the arrival of imported machinery.

NEW ZEALAND PLACES SCRAP EXPORT EMBARGO

Exports of scrap iron and steel from New Zealand are now prohibited except with the consent of the local minister of customs, according to a report to the commerce department.

The government is reported to have under consideration the possibility of establishing a local iron and steel industry, one of the primary reasons for the scrap embargo. In addition, encouragement is being given to private capital to develop iron ore reserves in New Zealand.

RULES ON PIPE FITTINGS

The commissioner of customs in a letter to the collector at Buffalo has held in connection with unfinished cast iron pipe fittings imported into the United States that "merchandise described as pipe fitting castings, approximately 2 inches in diameter, not drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process, except that fins and scales are removed, are dutiable at the rate of 20 per cent ad valorem under paragraph 327 of the tariff act of 1930 as castings wholly of cast iron."

Now Is Good Time To Ask for Itemized Statement on Relief Costs

THIS is the season of the year when industry's obligation to society is emphasized strongly through the medium of community fund campaigns. Every large city has its annual drive for funds for local charities, and, as a rule, industrial corporations contribute liberally.

When the community funds were introduced, their sponsors made a strong point in arguing that these funds would take the place of the hundreds of small, individual, unco-ordinated appeals for charity which were then prevalent. The fund was to put community charity on a business-like basis.

No one will deny that in many cases the community funds did simplify and systematize the administration of local relief. However, with the passage of years conditions have changed radically. Today we encounter a situation which may well challenge the attention of industrial executives who are entrusted with the distribution of corporate funds.

In Spite of Liberal Federal Relief Expenditures, Burdens on Local Organizations Are Heavy

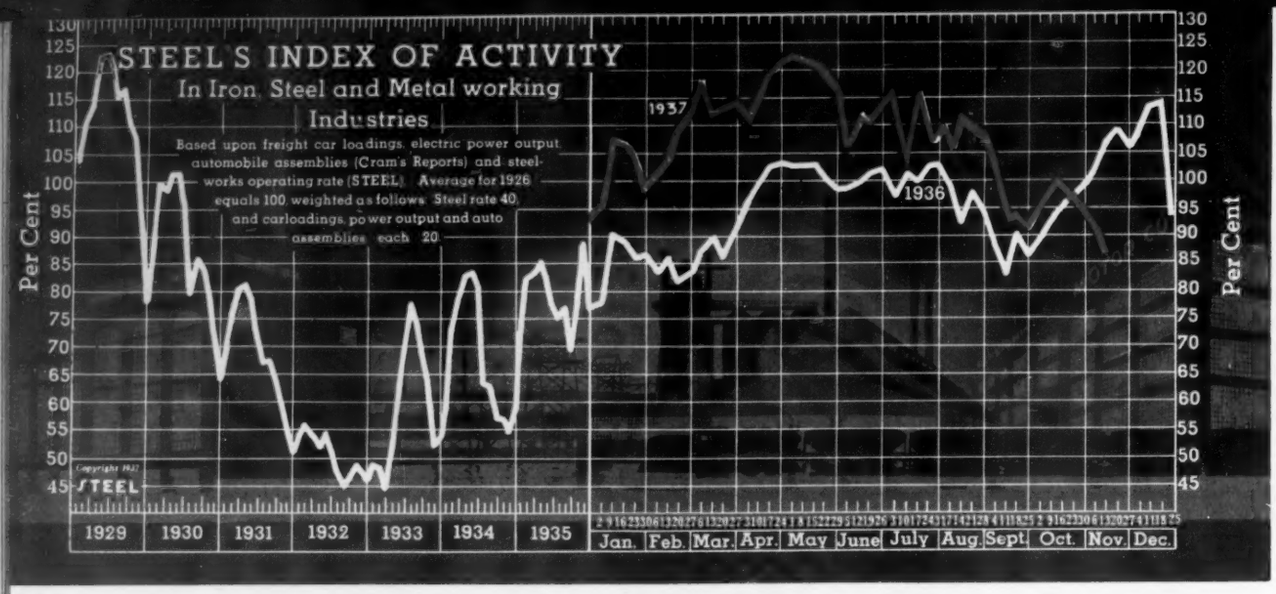
The community funds, in most cases, undoubtedly are continuing to render necessary services efficiently. However, these funds seem to require just as much support now as they did before the federal government went into relief on a gigantic scale. At the same time the number of individual, private or "outlaw" charities—which sponsors describe as worthy projects not covered adequately by federal funds or by the official community fund disbursements—is increasing instead of diminishing.

Something is wrong somewhere. The average industrial corporation pays taxes ranging from 30 to 40 per cent of its net profit. As is well known, a large part of this exorbitant tax levy goes for relief. Much of this expense is for services which prior to 1933 were rendered by local charitable or social organizations or by the relatives of dependents. Yet the expenditure of billions of dollars in this manner has not lightened the local burden.

"Haves" Are Paying Much More Than Should Be Necessary for Adequate Relief of "Have Nots"

We hear a lot about the moral obligations of the fortunates to the unfortunates. The majority of citizens as well as the majority of business executives recognizes the obligation of legitimate charity. But it is too apparent, in the present situation, that those who have are contributing much more than is actually necessary to fulfill the social relief and service needs of the "have nots."

Many "haves," including corporations, salaried executives and wage earning employes, are being soaked twice and three times for identical services.


STEEL'S INDEX OF ACTIVITY
In Iron, Steel and Metal working Industries
Based upon freight car loadings, electric power output, automobile assemblies (Cram's Reports) and steelworks operating rate (STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20
1937
1936
Per Cent
STEEL
1929 1930 1931 1932 1933 1934 1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

STEEL'S index of activity declined 5.6 points to 86.7 in the week ending Nov. 13:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Sept. 4	104.8	87.5	70.9	53.5	65.5	45.4	65.3	79.0
Sept. 11	94.3	83.1	70.1	58.7	69.1	44.9	60.9	85.0
Sept. 18	95.0	90.1	69.4	58.1	68.2	47.8	65.6	86.2
Sept. 25	93.0	86.2	68.5	89.3	66.9	48.0	65.2	83.8
Oct. 2	96.0	89.0	73.3	54.7	67.4	47.7	62.4	81.0
Oct. 9	99.0	83.4	74.9	56.4	66.0	48.4	61.5	79.4
Oct. 16	101.8	95.5	77.4	58.2	60.9	48.7	57.9	77.5
Oct. 23	97.5	97.1	82.4	56.3	58.0	48.7	58.2	78.8
Oct. 30	95.7	99.1	86.4	55.0	52.3	48.4	59.2	72.5
Nov. 6	92.3	102.1	88.4	54.9	50.7	48.5	56.0	71.5
Nov. 13	86.7*	107.9	88.8	55.2	52.6	47.7	55.5	73.0

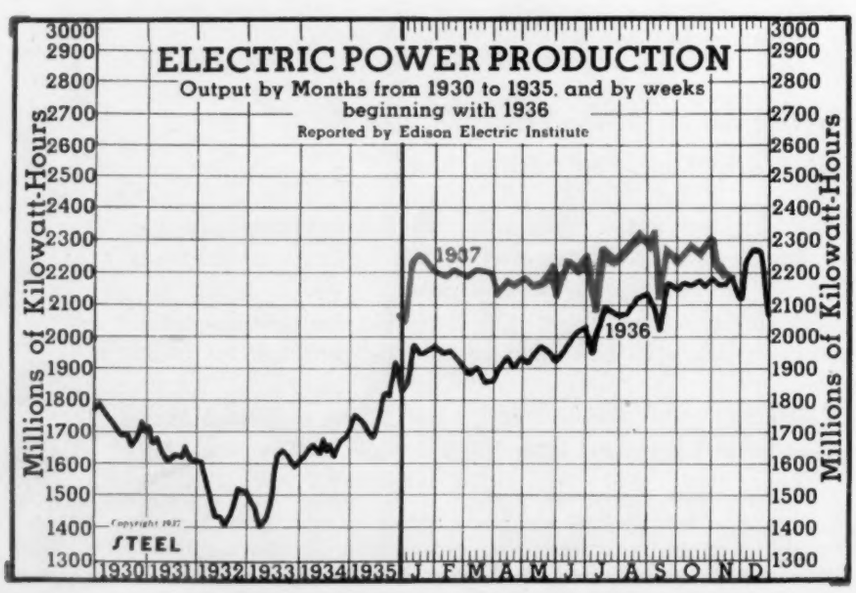
*Preliminary.

New Demand Insufficient To Check Downward Trend

DUE to the sluggishness of new demand, industrial activity still is tending downward. In the week ending Nov. 13, STEEL'S index dropped to 86.7 from 92.3 in the preceding week. The decline was caused by further recessions in freight car loadings, electric power output, automobile production and the rate of steelworks operations.

Except in the case of power output, the current figures for these barometers are substantially below the corresponding figures for last year. Further postponement of volume production on 1938 Ford models to near the end of November has served to extend the downward curve of total motor car output. Weekly output has declined moderately in three consecutive weeks. A year ago, automobile production had crossed the 100,000 car per week mark for the first time in the new model season.

Faintly favorable signs are discernible in forthcoming rail purchases by some roads and in the fact that the response of the public to some of the automobile shows in the middle west and southwest is more encouraging than the reception accorded the New York show.

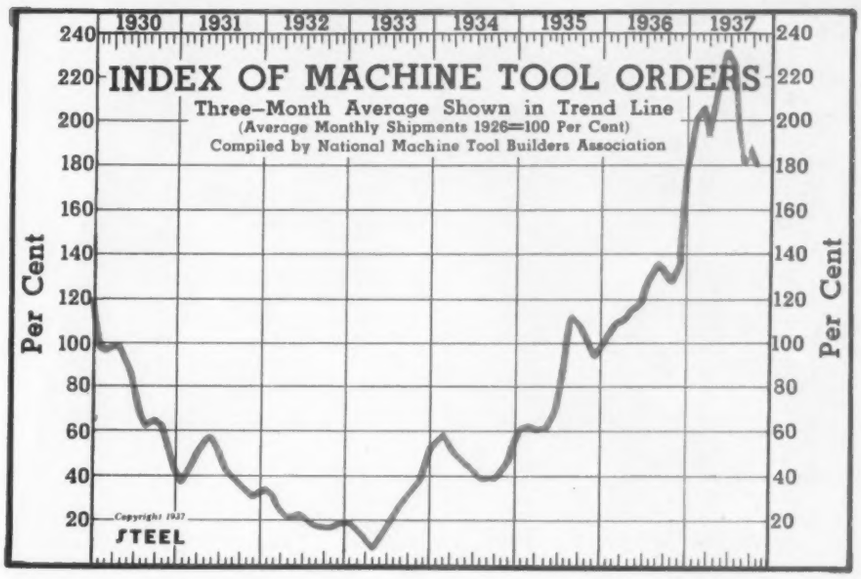

ELECTRIC POWER PRODUCTION
Output by Months from 1930 to 1935, and by weeks beginning with 1936
Reported by Edison Electric Institute
Millions of Kilowatt-Hours
1937
1936
STEEL
1930 1931 1932 1933 1934 1935
J F M A M J J A S O N D

	1937	1936	1935	1934
Nov. 13	2176	2169	1938	1691
Nov. 6	2202	2169	1913	1675
Oct. 30	2254	2175	1897	1669
Oct. 23	2281	2166	1895	1677
Oct. 16	2276	2170	1863	1667
Oct. 9	2280	2168	1867	1656
Oct. 2	2275	2169	1863	1659
Sept. 25	2265	2157	1857	1648

BUSINESS TREND

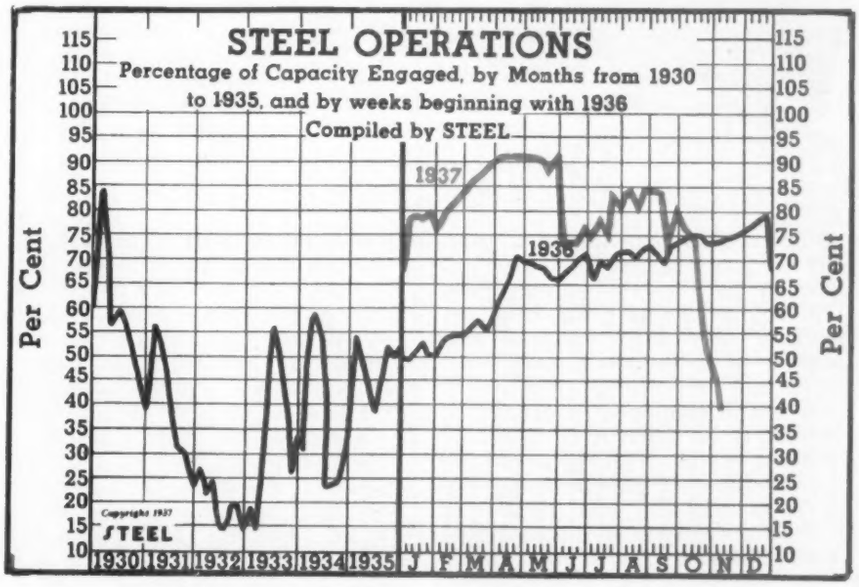
Machine Tool Index Down 6.4 Per Cent in October

	1937	1936	1935	1934
Jan.	201.7	102.6	61.3	56.5
Feb.	207.7	107.1	61.5	58.2
March	192.4	109.4	60.3	50.9
April	219.8	114.4	60.3	48.5
May	234.2	116.6	67.1	46.8
June	227.6	124.5	76.7	42.6
July	190.5	132.6	94.7	38.6
Aug.	180.9	135.5	112.2	37.1
Sept.	187.2	132.0	108.5	37.4
Oct.	180.8	127.5	102.9	40.5
Nov.	.....	134.0	93.8	44.2
Dec.	.....	180.4	89.9	54.1


INDEX OF MACHINE TOOL ORDERS
Three–Month Average Shown in Trend Line
(Average Monthly Shipments 1926=100 Per Cent)
Compiled by National Machine Tool Builders Association
1930 1931 1932 1933 1934 1935 1936 1937
Per Cent
Copyright 1937 STEEL

Steel Operations Continue Sharp Decline From Sept. 18

	Per Cent		
	1937	1936	1935
Nov. 13	39	74	52
Nov. 6	47	73	53
Oct. 30	51	73	54.5
Oct. 23	53	73	52.5
Oct. 16	63	75	51
Oct. 9	66	75	52
Oct. 2	74	74.5	53.5
Sept. 25	76	73	51
Sept. 18	80	72.5	52
Sept. 11	72	69.5	54.0
Sept. 4	83	71.5	52


STEEL OPERATIONS
Percentage of Capacity Engaged, by Months from 1930 to 1935, and by weeks beginning with 1936
Compiled by STEEL
1937
1936
Per Cent
Copyright 1937 STEEL
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D

Steel Shipments Decline Sharply in October

	Gross Tons		
	1937	1936	1935
Jan.	1,149,918	721,414	534,055
Feb.	1,133,724	676,315	583,137
March	1,414,399	783,552	668,056
April	1,343,644	979,907	591,728
May	1,304,039	984,087	598,915
June	1,268,550	886,065	578,108
July	1,186,752	950,851	547,794
Aug.	1,107,858	923,703	624,497
Sept.	1,047,962	961,803	614,933
Oct.	792,310	1,007,417	686,741
Nov.	.....	882,643	681,820
Dec.	.....	1,067,365	661,365

MONTHLY FINISHED STEEL SHIPMENTS
By U. S. Steel Corp.
1930 1931 1932 1933 1934 1935 1936 1937
Thousands of Tons
Copyright 1937 STEEL

Buildin Mo

Mode Me

Fig. 1 — Milling and drilling standard motor frames. Lightweight bridge cranes lift frames in and out of machines

■ Economical handling of a product in manufacture is a most important item at the present time. The higher the rate for labor, especially skilled labor, the more necessary it is to insure that labor is applied productively. The higher the cost of equipment, the more essential is its interrupted use as a productive tool. The higher the cost of materials, the more advantageous it is to minimize time in process.

Confronted with an increasing demand for industrial alternating-current motors and finding its scattered manufacturing facilities inadequate, Westinghouse Electric & Mfg. Co. recently completed and placed in operation at its East Pittsburgh, Pa., works a new motor aisle incorporating the most up-to-date layout, machine tools, production control, materials handling and industrial lighting (STEEL, Nov. 15, p. 30). Motors ranging from 1 to 50 horsepower are built in the new plant.

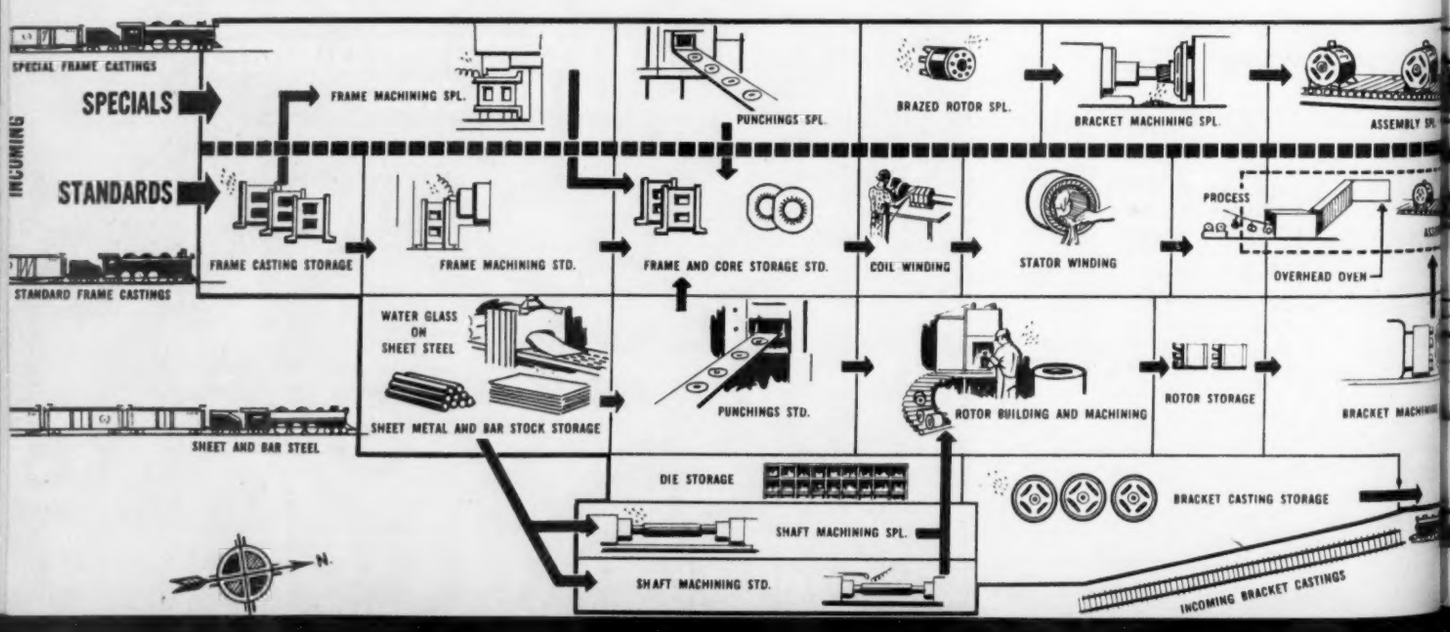
The handling system attains all the essentials by creating a straight-line flow of material from raw stack through processing to the finished motor. Material is fed to the various process units at proper levels and the principal products and by-products are carried away with the least amount of handling or delay. The system furthermore serves as a pace setter for operators and is an indispensable factor in machine loading and production scheduling. All this in turn insures prompt delivery of motors to the customer.

Best handling of any product generally is its least handling. Considering castings, magnetic sheet steel, insulated wire, cotton tape, paints and varnishes as raw materials, the Westinghouse company has consolidated in proper relationship in one area, on one floor level and under one responsibility, virtually all operations for building, warehousing and shipping industrial induction motors.

New Space Provided

To obtain the required space, an open court between two buildings was roofed over with a welded structure and separating walls were removed. This gave an area of 197,000 square feet which was floored with reinforced concrete and provided with service facilities.

Essential parts of a standard induction motor are a frame, a stator core, a set of stator coils, an axle



lin Motors by

le Methods

Fig. 2 — After being machined, frames are stored in this area. They are handled by conveyors and bridge cranes

or shaft, a rotor core with winding, a set of bearings and two brackets to house the bearings and support the rotating element. While design of many of these parts is standardized, making possible their production in large quantities, there is a growing demand for custom-built motors for particular applications.

To obtain benefits of quantity production without interference from special items, two manufacturing lines were set up. One consists largely of special-purpose equipment designed for the production of standard parts and motors; the other of general-purpose equipment for production of special items and custom-built motors.

Straight-Line Flow

Each of these lines has unit manufacturing centers that supply parts by conveyor to subassembly and final assembly positions. In each line the objective was to so arrange departments that flow of work is from raw material storage at one end of the building to finished motor storage and shipping department at the other end. Principal raw materials, such as magnetic sheet steel, axle steel and castings, are delivered in broad-gage railroad cars to allotted storage areas adjacent to the machining departments.

Design and location of each machine tool, bench and conveyor was studied by the layout engineer, tool supervisor, time study men, production scheduling department, department foreman and general foreman. In many instances, design engineers suggested changes in the product which influenced factory layout. Each operation was analyzed with a view to keeping machinery and workmen gainfully employed. To do this requires that movement of pieces between operations be kept as nearly as practical at the proper working height.

Gravity roll conveyor is used to accomplish this, although some use is made of power-driven booster belts and live-roll conveyor. Overhead chain conveyor is used in processing stator windings. Caster-type boxes were introduced to handle small finished parts from machining through stages of assembly. It was the aim to limit use of cab-operated cranes to handling of large weights and they are found principally in the raw materials and finished motor storage areas.

Handling facilities were required to accommodate motors weighing from 50 to 1500 pounds each. This necessitated nearly 2 miles of conveyor of the gravity-roll, belt, chain, slat and live-roll types, and crane facilities ranging from a simple chain hoist on a jib to a 10-ton overhead crane equipped with floor control. Four railroad spurs were required for handling raw materials,

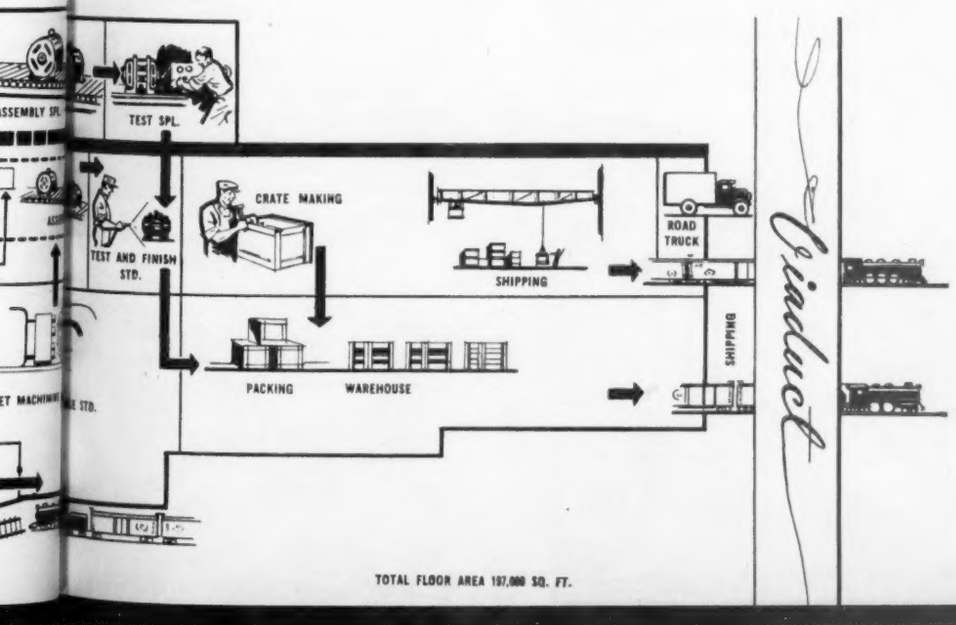


Fig. 3—This chart shows the new motor aisle layout and flow of manufacturing from raw materials to finished product

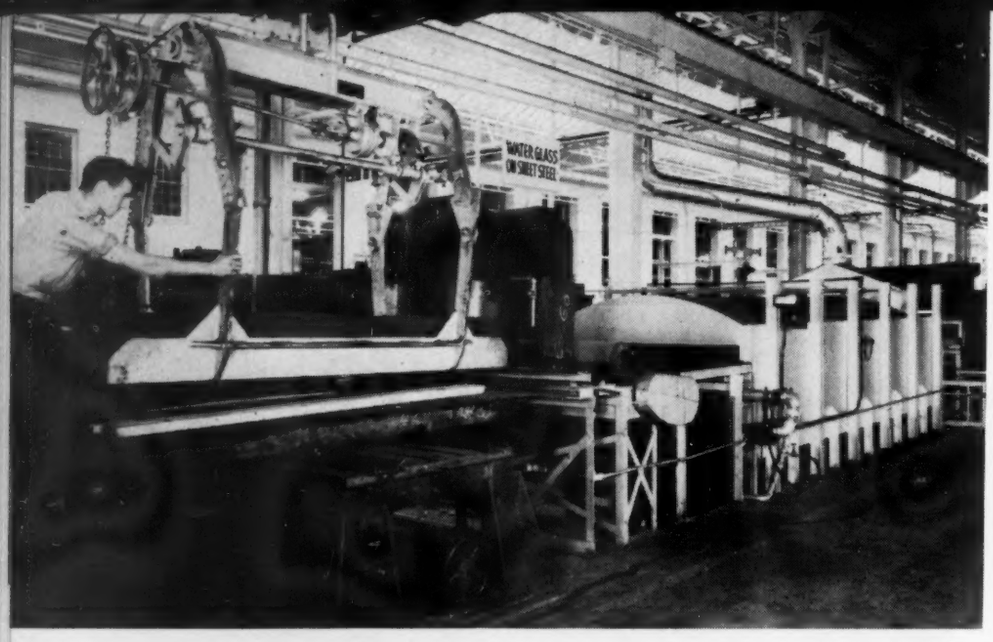


Fig. 4—Operation of sheet lifter for unloading bundles of electrical sheet steel for treatment in the water glass processing oven

Fig. 5—Stator lamination punchings are produced on this mechanical feed press

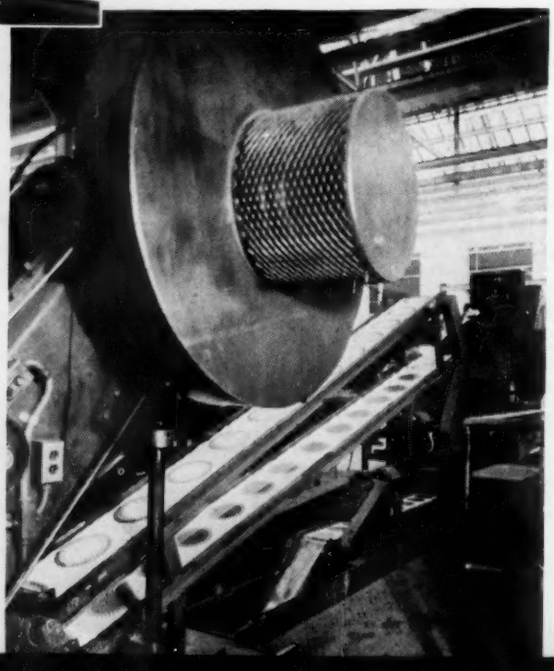


Fig. 6—Double take-away conveyors remove stator punchings and "sunflowers" from the press

including 700,000 pounds of electrical sheets, 150,000 pounds of bar steel for shafts, and 1,000,000 pounds of castings for motor frames and brackets, per month.

The plant demanded supplementing of available equipment with $220,000 worth of modern machine tools and thousands of dollars worth of special tools and precision gages for control of quality on a quantity production basis. It required provision of windows and skylights covering nearly 40 per cent of roof and wall space to obtain maximum natural light. This was supplemented with artificial lighting giving 25 foot-candle intensity, which is nearly two times the intensity ordinarily used in a manufacturing plant.

Fig. 3 shows a flow chart of the new manufacturing area. Flow of production is from south to north in two parallel lines, one from the standard motors and one from the special. Raw materials are received from the south yard railroad spurs and completed motors are shipped from the north yard spurs.

Cast-iron frames for standard motors weighing 20 to 400 pounds, are delivered in open gondola cars from the foundry several miles away, and are unloaded in a storage area within the building and ahead of the frame machining group. Here sufficient quantities are accumulated to permit handling in economical machine cycles. Segregated to bore diameter, frames are moved at proper working level to three machining centers on gravity roller conveyors. Due to the distance between operations, it is necessary to boost the frames to a higher elevation when one operation is completed in order to convey by gravity roller conveyor. This is accomplished by short inclined belt conveyors. Light-weight bridge cranes are utilized for lifting frames in and out of machines.

Automatic lathes are used in boring the frames, hydraulic milling machines to mill the feet and three-way multiple drill presses to drill and tap complete. Milling and drilling operations are shown in Fig. 1. Completely machined frames are removed on gravity-roll conveyor to a storage area, Fig. 2. Here they are stored through aid of an inclined belt conveyor, gravity roll conveyor and bridge cranes to await matching with laminated cores.

Sheets Are Processed

Electrical sheet steel for the laminated cores is delivered in open gondola cars to the adjacent aisle, where it is unloaded with a 10-ton crane. The sheets are fed through a processing oven, Fig. 4, to coat them with water glass, a special sheet lifter being used to deliver the sheets to the operator who feeds them through power-driven, felt-covered rolls for the thin coating. Then the sheets pass through the oven on a continuous chain where the moisture is burned off, leaving a thin coating of silica, and are deposited in a specially-designed catcher with removable sides so that the sheet lifter can again be used to convey the coated bundle of sheets to the slitting operation.

After slitting, the sheets are blanked into squares. Automatic presses produce the punchings for stator and rotor laminations. Taking 1 to 3 horsepower motors as an example, punchings are made from sheets 0.017-inch thick requiring 59 punchings to build 1-inch of core. Approximately 420 individual punchings are used in stator and rotor of the average motor this size.

Blank disks are produced on an upright punch press with roller feed, making four 8¾-inch diameter blanks per stroke, the blanks being nested to give greatest material economy for sheet size. The blanks are punched through the die onto a belt conveyor which conveys them to a sorter where defective blanks are removed and punchings automatically stacked. They are then placed

on trays and stored in space adjacent to the stator punch presses.

The complete stator punching is produced on an inclined press, Fig. 5, automatically fed by a magazine feeder with the press operating at 65 strokes per minute. A compound die is used and the completed punching is ejected from the punch part of the die onto a chute to the top of the belt of an inclined double belt conveyor, Fig. 6, which carries it to a second chute and thereby deposits it on a horizontal belt conveyor. The horizontal conveyor delivers the blank to an automatic stacker where it is lined up by an external keyway ready for weighing and riveting.

Presses Are Synchronized

The center portion of the blank, called the "sunflower" has 36 to 48 projections which are in the form of the stator slots and resemble the petals of a flower. This part is ejected from the bottom or die part of the compound die by means of a spring stripper. It drops onto a chute which delivers it to the bottom belt of the double-belt conveyor. This punching then is conveyed to a three-latch feeding chute, which is cam timed from an inclined punch press. The press runs at a slightly higher speed than the first press, or 73 strokes per minute.

Automatically fed into a trimming die, the sunflower has its petals cut off, producing a disk 5⅞ inches diameter. This disk is punched through the die and goes down a chute to a belt conveyor running beneath the floor and is delivered on this conveyor to an automatic stacker. Disks from the stacker are stored adjacent to the rotor press.

Rotor blanks are taken from storage or directly from the stacker and loaded into feeders of the rotor punch presses. These presses are inclined and run at 75 strokes per minute, the blanks being automatically fed into the piercing die which makes a complete rotor punching. The punching is stripped from the top or punch part of the die, and falls into a chute to a belt conveyor which carries it to an automatic stacker. Here it is stacked on a rod in correct alignment with the shaft keyway; punchings are stored on these rods and taken from them when the rotor is die cast.

In the layout of the belt conveyors, it was found that the angle to convey these light punchings properly could not exceed 18 degrees, unless a sub carrying device was used. Scrap, as a by-product, in the manufacture of motor laminations also is a major problem since there is practically as much scrap material in the forming of the stator and rotor slots, various vent and shaft holes as there is material in the finished punching. The punch presses are producing these punchings 65 to 75 per minute, so it is obvious that efficient means of handling scrap is important.

Fig. 7—Winding "mush" coils in motor stator. The ring-type fixture permits movement of the frame both radially and axially

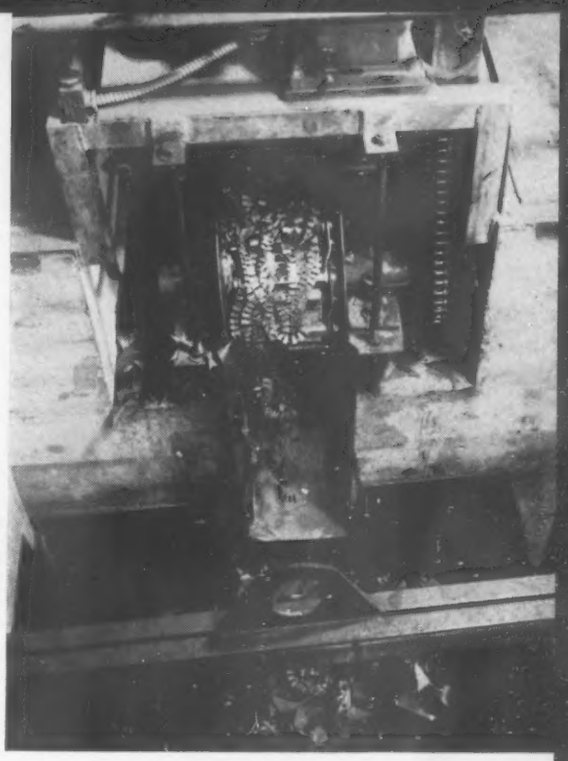


Fig. 9—Scrap from the punch presses is removed by this underfloor conveyor and deposited in the bucket in the pit

Therefore, three main scrap conveyors of a drag-link type were provided. One takes the scrap from seven first operation presses, one from seven trip presses, and one from six rotor presses. These conveyors run beneath the floor with suitable openings under the various presses to permit the scrap to fall onto the drag links. It is carried to large containers located in suitable pits at the end of the conveyor, as shown in Fig. 9. These containers are then handled with an overhead crane to the baling machine.

Windings Placed in Stators

Stator cores are matched with the cast iron frames and pressed into place under a hydraulic press, after which the assembly is delivered to the winding department on gravity roller conveyors. The "mush coils" for stator windings are made on semiautomatic winding machines and are matched with the cores on the dispatch conveyor. These move to the proper winding center, Fig. 7, as determined by frame size and class of winding. After winding, taping and connecting, the stators are subjected to a high-frequency test which detects defects in insulation or winding.

Testing completed, each stator moves on to the processing oven. Here the stator is elevated by an

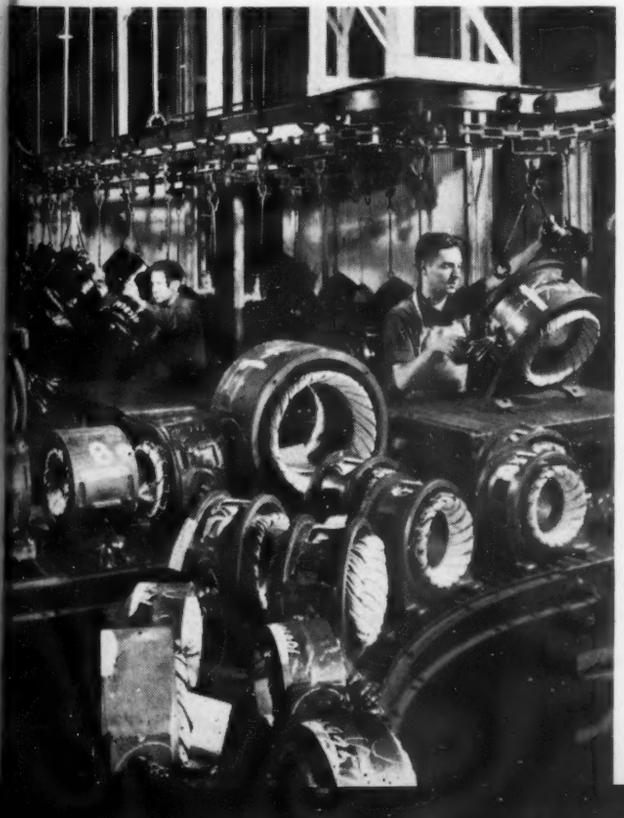


Fig. 8—An air lift section in the roller conveyor facilitates transfer of frames to the overhead conveyor for dipping and baking the stator

Fig. 10—Rotors of aluminum alloy are die cast around the laminated core in this battery of machines. A number of cast rotors rest on the conveyor

air-lift section of the conveyor, Fig. 8, and hooked onto the oven chain conveyor which carries the stator through several varnish dips and two baking periods. Speed of the conveyor is set to give proper dipping and baking time. The processed stator is removed from the chain conveyor by another lift section and delivered by roller conveyor to the cleaning operation. After the varnish is removed from machined surfaces, the bore is ground concentric with housing fits. The stator, now complete, is ready to be matched with a rotor and sent to the assembly department as shown in Fig. 11.

Bar stock for shafts, 1 to 3½ inches in diameter and 18 to 25 feet long, is delivered in open gondola cars to the same aisle as the sheet steel where it is unloaded by a 10-ton overhead crane into upright storage racks. The bars are handled to power cut-off saws by a 3-ton gantry crane, and after being cut to shaft length, are centered and placed on special pallets. The pallets are delivered to the shaft machining department, Fig. 12, on gravity roller conveyor, the pallets being so constructed that they roll lengthwise with the conveyor and can be pulled off to the side of the conveyor line on stands adjacent to various machines. A number of the loaded pallets, which weigh about 800 pounds, are to be seen in the illustration.

The shafts are carried in these pallets on roller conveyor from one operation to the next through machining and inspection to storage. Next, shafts are pressed into die cast rotor cores, this operation being alongside the storage racks and in line with the die casting machines, Fig. 10, that build the rotor cores. From this point on through machining, fitting of ball bearings, inspection and storage, the rotors are conveyed on metal chutes.

Units Go to Assembly

Roller bearings, caps and cartridges are assembled to rotor shafts just ahead of the matching point where stator and rotor meet. Rotors are placed within the bores by hand or light-weight bridge cranes. From this point, the units travel on roller conveyors to final assembly.

Bracket castings are received from the foundry in boxes on flat cars, the cars being spotted at the unloading dock alongside casting storage. The storage area and cars are serviced by a floor-operated overhead crane. From storage, boxes are moved on roller conveyor to the first operation of painting, the paint booth being located inside the factory building and in line with succeeding machining operations. Brackets are taken from the foundry boxes, painted and placed in special trucks, the emptied foundry boxes being returned to the outside storage yard on roller conveyor to be sent back to the foundry by gondola car.

The special trucks are used to convey the brackets through machining and inspection to storage; from storage the trucks are pushed to mo-

Fig. 12—This is a general view of the shaft machining department showing conveyors, shaft pallets and pull-off stands

Fig. 11—View of the roller conveyor lines used for dispatching stators and their matching rotors to the assembly department

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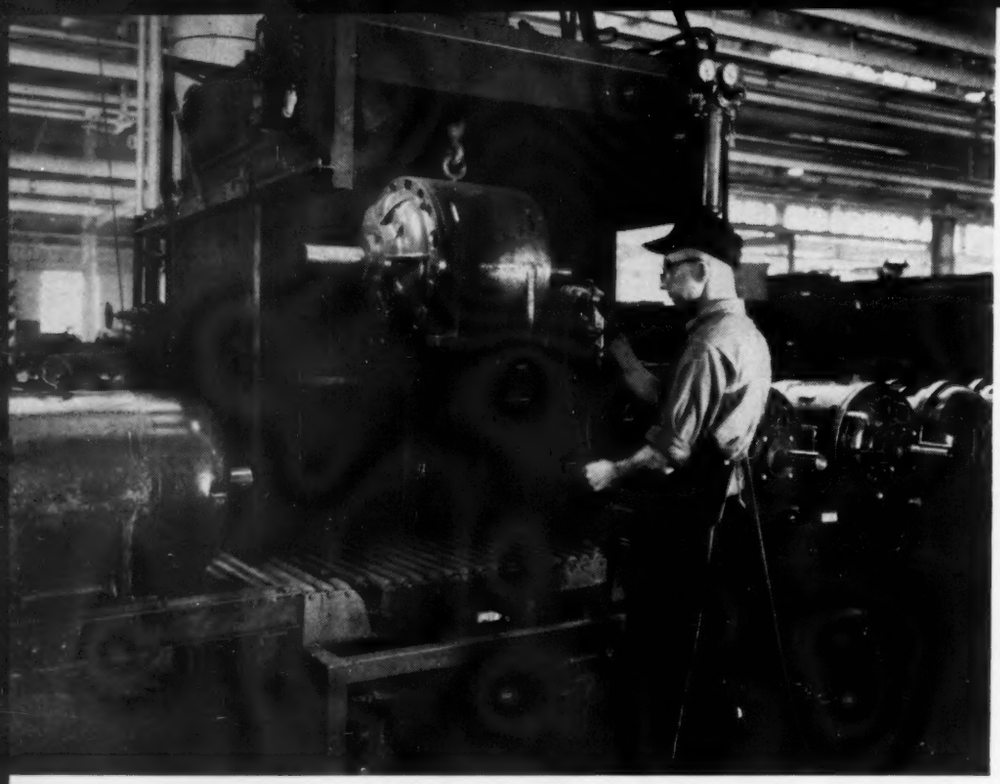


Fig. 14—Spray painting booth. Note the air-operated hoist for lifting motor, the conveyor turntable and air-operated baffle doors

Fig. 14, for the final coat of paint. Nameplates, conduit boxes and similar details are assembled and the motors move through the partition to the warehouse shipping floor.

Handling of Special Motors

Special motors, manufactured in a separate aisle, are built on customer's orders and delivery time is important. For this reason, flexibility of equipment is emphasized. Also, materials handling devices are quick acting and adaptable to peak loads. General purpose machine tools are provided to get the necessary flexibility with lowest set-up cost. Overhead cranes are used to permit frequent segregation and interchange of parts to match with production schedules and shipping dates.

Many of these special motors require standard parts which are supplied from the standard aisle adjoining. Sequence of operations is much the same as the standard motor aisle. After assembly, the motors are moved to the special test floor, and after testing, they move on gravity roller conveyor to join the standard lines for painting, final inspection and shipping.

An independent box shop is located adjacent to the packing floor and here skids and crates are made. Two lines of conveyor, one for standard motors and one for special motors, enter the packing department and overhead of each is an electrically-

(*Please turn to Page* 74)

tor assembly positions. At the assembly points the trucks are emptied and returned to the paint booth to be reloaded.

Bearing cartridges and cap castings are handled in a manner similar to the brackets. The same boxes are used and are stored in the same storage yard. Roller conveyor is used to convey the items inside the building to machining equipment. Special trucks are used to convey the castings through machining, washing, inspection and to storage.

Assembly Operations Completed

Assembly stations are equipped with turntables so that motors may be turned for assembly of the end brackets. Assembled motors move from the various stations on gravity roller conveyor to a test position; after test, the motors move down the conveyor to a spray booth,

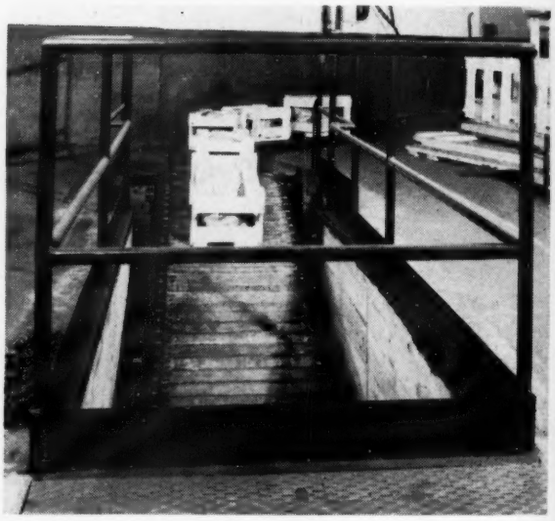


Fig. 13 — Discharge end of tunnel conveyor which transports crated motors from warehouse floor to shipping floor, the latter being at a 52-inch higher level

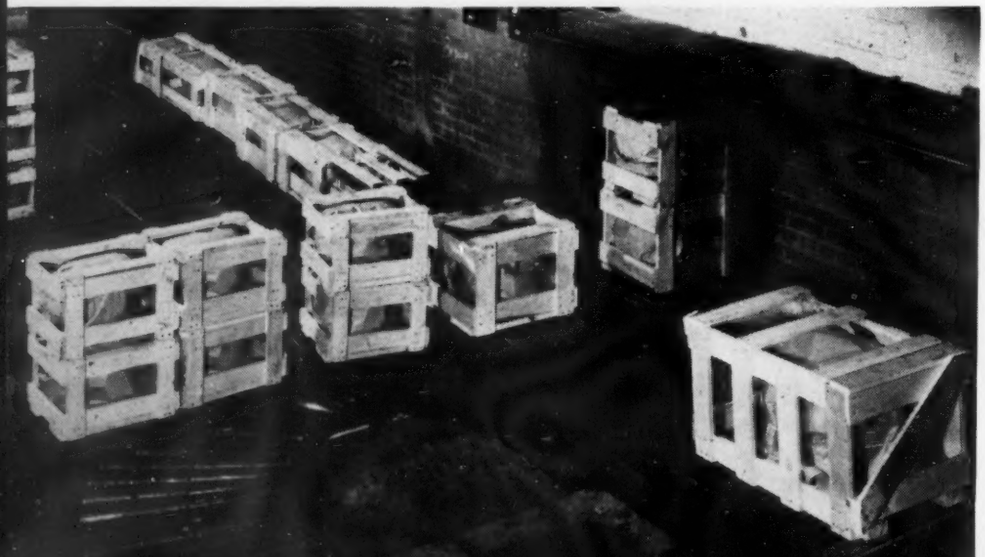
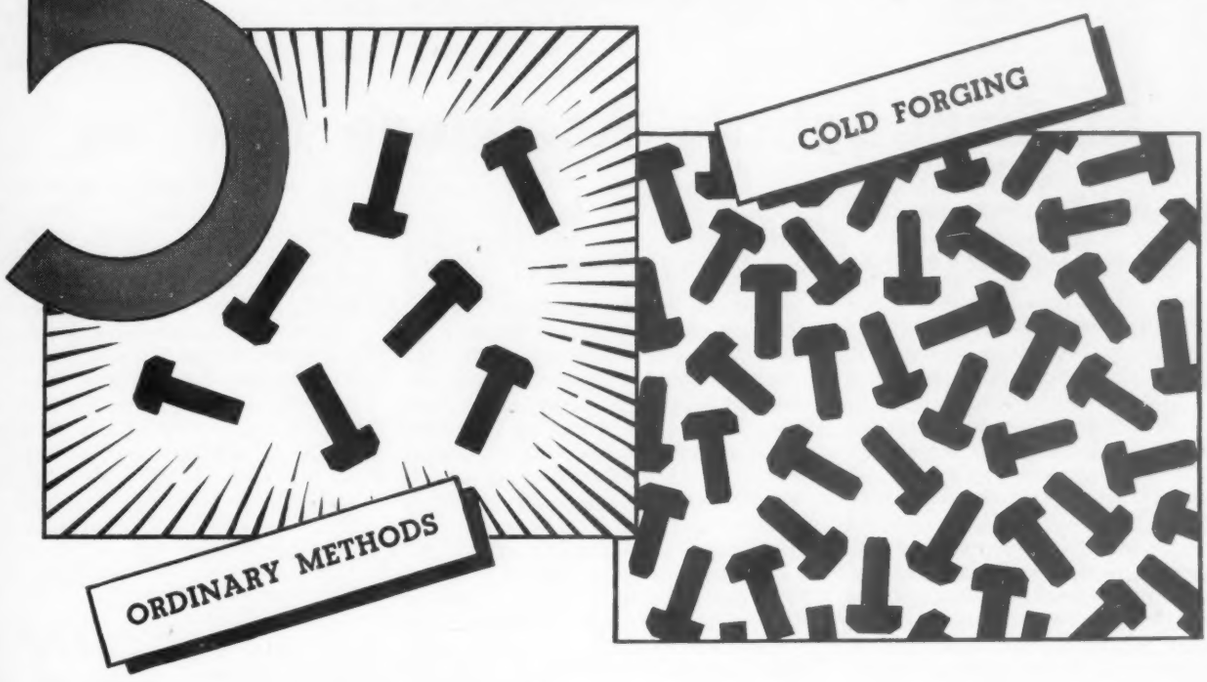


Fig. 15—Entrance to conveyor tunnel, showing turntable. Some motors are being sent to the shipping floor, others to stock

5 MINUTES' OUTPUT



● **The rough comparison between slower methods and cold forging shows why the swing is to cold forging. Why shouldn't manufacturers of small parts change over to the method that gets work out so fast? Manville cold forging machines shoot production way up . . . yet cut down stock costs, manual operations and production steps. Stock waste is wiped out entirely. The finished blank is often stronger due to improved grain.**

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Progress and Development Outlined

In Birmingham Acetylene Meeting

■ GREAT progress has been made during the past year in the use of acetylene in the metal producing, metalworking and other industries, according to reports during the technical sessions of the International Acetylene association at its thirty-eighth annual meeting, held at Birmingham, Ala., Nov. 10-12. The program was well rounded out and covered all principal uses of the process as well as several new ones.

Noteworthy features of this convention were two evening sessions devoted to round table discussions. Attendance at these sessions aggregated more than 1000, including representatives of the steel and metalworking industries throughout the Birmingham district. At these discussions questions concerned with the use of the process were answered by qualified technical advisors from various parts of the United States. A good many questioners were informed as to the solution of some of their manufacturing problems.

Machine Gas Cutting

A valuable paper entitled "Management of Machine Cutting Operations," was submitted by R. F. Helmkamp, Air Reduction Sales Co. Pointing out that the application of machine gas cutting to general manufacturing problems has been relatively slow, Mr. Helmkamp set forth a general description of the process, its possibilities and its limitations. He recommended that plant executives see that their department heads are familiarized with the process, since in most cases, when these men think in terms of this process, they are able to effect economies by using it in one or more manufacturing operations.

A paper of value to electrical superintendents of steel producing and other plants was that by R. A. Goeller, vice president, Hatzel & Buehler Inc., New York. It described a new method of joining copper bus bars developed by this company in an installation of more than 20 tons of copper bus bars, capable of delivering some 36,000 amperes at 4 to 5 volts, at the large electrogalvanizing plant of Republic Steel Corp.'s Steel & Tubes plant, Brooklyn, N. Y. The bars were brazed together in lap joints, using an alloy containing 80 per cent copper, 15 silver and 5 phosphorus with a melting point of 1300 degrees Fahr. This alloy was placed between the lap joints in sheets 0.010-inch thick and the bars held firmly together by means of a screw clamp. The joint was brought up to temperature and the screw clamp tightened until some of the brazing metal was forced out at the sides.

Flame Effects on Steel

"Cutting and Tempering of Structural Steels" was the title of a valuable paper submitted by H. H. Moss, development engineer, The Linde Air Products Co., New York. While the oxyacetylene cutting flame provides a simple and economical production tool for shaping steel, said Mr. Moss, all grades of steel do not react the same way physically in going through the cutting process, taking on properties in the cut surfaces differing from those initially present in the steel. Replete with test data in connection with quench and air hardening steels, Mr. Moss' paper detailed three methods of flame softening. In two tf these methods the softening treatment is mainly a matter of increased gas consumption inasmuch as the operation is carried out simultaneously with cutting and at the usual cutting speeds. By the third method, which is non-simultaneous with cutting, the softening operation usually is conducted at a higher speed so that the extra cost is only slightly higher than with the other two methods. The paper concluded with a long list of applications in which flame softening is beneficial.

Two papers on flame hardening featured the meeting. One was by R. L. Rolf, Lakeside Steel Improvement Co., Cleveland, and the other by John T. Howat, American Spiral Spring & Mfg. Co., Pittsburgh. Both speakers showed slides illustrating the operation of the process and its wide range of usefulness. The process was reported as being very flexible and as having an unlimited range of adaptability provided the surface area to be hardened is not too large a single area of thin section. By this method, it was said, it is possible to harden portions of surfaces that can be hardened in no other way.

Existing widespread application of the oxyacetylene process in flame cutting parts of machines and other steel assemblies was indicated in impressive manner by two papers which the authors accompanied with a great many slides showing such parts. These papers, by A. E. Gibson, president, Wellman Engineering Co., Cleveland, and Richard W. Sternke, production manager, Lakeside Bridge & Steel Co., Milwaukee, told of the freedom of design which is possible with this method, the accuracy with which contours may be cut by this process and included many practical hints as to how problems of distortion and other difficulties are overcome.

Used in Steel Mills

Economic operation of steel mills is dependent to a great extent on the element of time, said W. J. Sannemann, service metallurgist, Tennessee Coal, Iron & Railroad Co., Birmingham. The oxyacetylene process ranks tops as a service tool because it permits removal of damaged or worn parts and then serves as the medium through which the repair is made. It has many other applications. In many instances it is used in removing cobbles without materially disturbing the mill setup. One of its greatest time saving uses is in the removal of salamanders at blast furnaces.

Pointing out that our merchant marine is in dire need of vessels for transporting petroleum products, A. C. Leigh, Ingalls Iron Works Co.

Inc., Birmingham, said that a great many vessels which were built during the world war and which now are stationed in marine "graveyards" may be converted into tankers with a saving of 50 to 60 per cent as compared with the cost of new tankers. It is necessary to remove old undesirable framing, and to construct and install new bulkheads and framing. While the resulting vessel will not be speedy, this lack will prove no handicap in transporting oil.

While the oxyacetylene process now is used extensively in the reclamation of textile mill parts, said Hugh Comer, vice president, Avondale Mills, Sylacauga, Ala., its maximum application can come about only through high grade utilization of this process and by stimulating a spirit of cooperation between the repair shop and the foremen in charge of the various departments. This is because replacement parts must be to exact dimensions, with the result that foremen prefer to install new parts rather than reclaimed parts. By the nature of the textile industry the looms and other machinery employed are subjected to heavy duty with a resulting high amount of breakage.

Pipe Line Constructed

In the Frasch method of mining sulphur large quantities of hot and cold water, steam, compressed air and liquid sulphur are used, said O. B. McLaughlin, Freeport Sulphur Co., Port Sulphur, La. The only source for the large quantity of water required is the Mississippi river. To convey this water 10 miles to the company's plant entailed the construction of a pipe line, elevated about 6 feet above ground and supported by piling trestles. This job, an intricate construction problem, was carried out by using the oxyacetylene process of a large scale. Mr. McLaughlin's paper discussed details of this work.

Welding in connection with track maintenance is playing an important part in prolonging the life of rail, frogs, crossings, switch points and numerous other items which go into track structure, said R. W. Cummins, general manager, Central of Georgia railway, Savannah, Ga. This road, he said, was one of the first to adopt welding in the field with portable outfits, as a means of building up battered rail ends, buttwelding rails in street crossings and other work of this kind. Mr. Cummins described in detail this company's more recent use of the oxyacetylene process in buttwelding rails so as to have continuous track in two of its tunnels, with increase in rail life.

Bronze welding of cast iron pipe was the subject of a paper by Dr. J. T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham. He said that the company has studied and found satisfactory two methods of bronze welding, the collar type and the shear vee type. The collar type requires less bronze and is faster and more economical. It is satisfactory in ordinary conditions. The shear vee type is stronger and should be used when the weld is subject to unusual shocks or stresses.

Cast Iron Pipe Welded

Cast iron today need not be an undependable engineering material, according to C. L. Lane, works manager, Walworth Co. Inc., Attalla, Ala. He mentioned three standard analyses developed by his company for the manufacture of pipe to meet varying degrees of corrosion severity. A huge inventory would be required if the company were required to carry a full stock of pipe of these three analyses in all diameters and weights and lengths. This problem has been simplified by producing all pipe in 5-foot lengths which may be welded together in any lengths required. Mr. Lane's paper set forth numerous details of the practice which is followed in this connection.

T. R. Lichtenwalter, welding engineer, Republic Steel Corp., Massillon, O., presented a paper on the welding of stainless and alloy steels. It set forth some of the practices to be observed by welding operators in setting up sound welds in material of this description.

The oxyacetylene industry's fire hazard was the subject of an analytical report by J. I. Banash, the association's consulting engineer. One of the chief difficulties is that when oxyacetylene equipment is delivered to the consumer it passes out of the control of the manufacturer. Hence, it is essential that the manufacturer get the cooperation of the user. Representatives of the association, said Mr. Banash, constantly are appearing as speakers before groups of shop men, striving to educate them in methods of eliminating the possibility of fires. It has been found that the most effective way of reducing the fire hazard is to educate foremen at consuming plants. In general, said Mr. Banash, it should be remembered that every fire is a small one before becoming a conflagration; hence attention should be directed to the prevention of small fires. Mr. Banash found considerable encouragement in the fact that the number of fires is not increasing as rapidly as the industry.

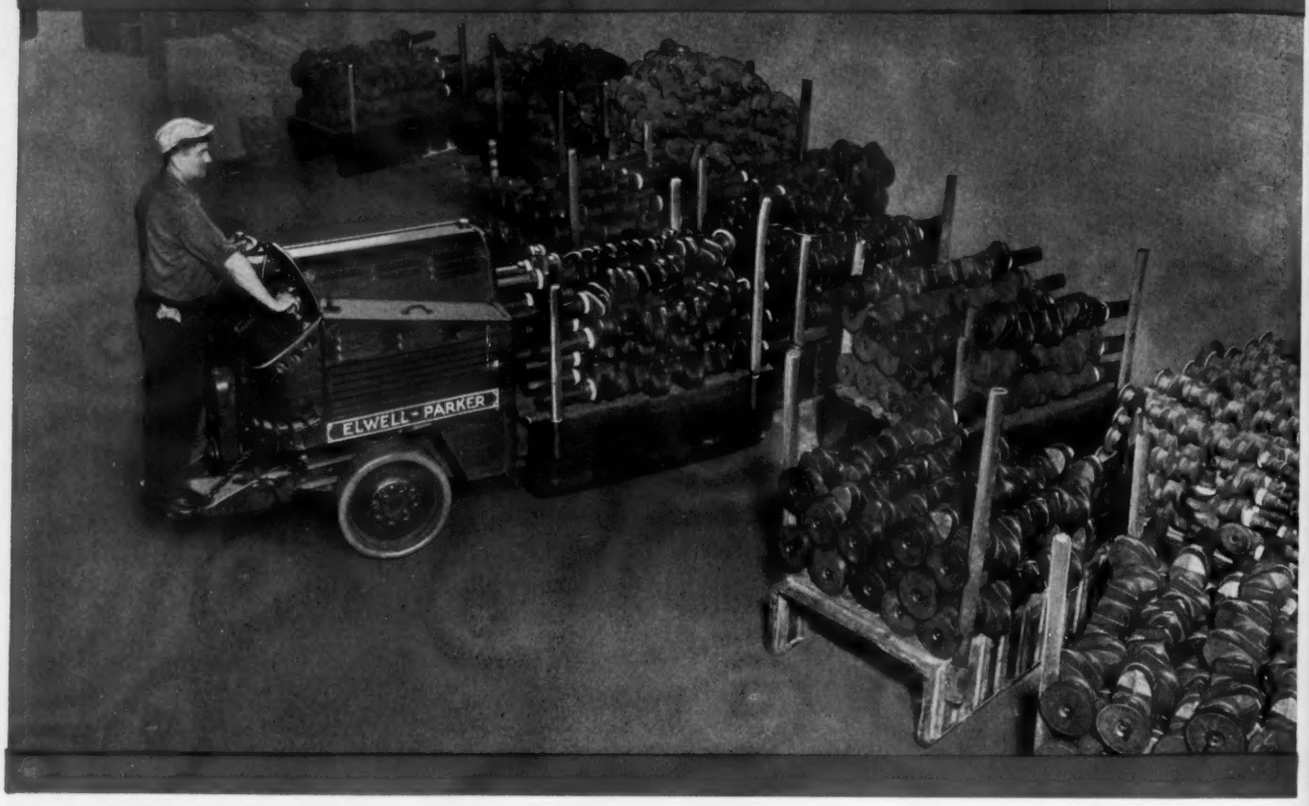
Legislation Is Reviewed

H. S. Smith, The Prest-O-Lite Co. Inc., New York, chairman of the association's legislative committee, told about efforts to prevent legislation now pending in certain cities from stifling the industry. Such legislation concerns the use and storage of compressed gases. The association, said Mr. Smith, has taken action to assist in the preparation of these ordinances so they will have no destructive effects. Because of the frequency with which occupational diseases are attributed to cutting and welding, particularly of lead and zinc coated sheets, said Mr. Smith, a welding operators' ventilation code is required.

A high spot of the convention was an inspection trip through the plants of Tennessee Coal, Iron & Railroad Co. at Ensley and Fairfield, Ala. This also included a visit to the company's red ore mines near Bessemer, Ala. The company concluded the excursion by serving luncheon at its Fairfield plant.

International Acetylene association's officers for 1938, from left to right, are: Vice president, H. P. Dolisie, Canadian Liquid Air Co. Ltd., Montreal; secretary, H. F. Reinhard, Union Carbide Co., New York; president, Elmer H. Smith, Commercial Gas Co., Minneapolis; treasurer, Henry Booth, Shawinigan Products Corp., New York

HALF THE COST OF MANUFACTURING MAY BE *Wasted*



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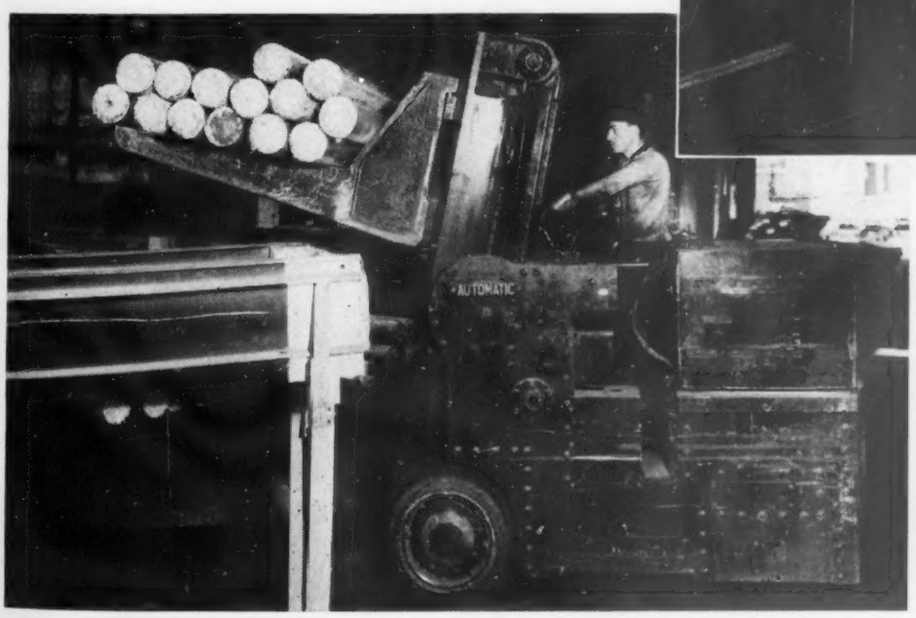
MATERIALS HANDLING

Fork Trucks Handle Brass Billets and Slabs

■ KEY piece of equipment between casting shop and rolling mills at the Michigan division, Revere Copper & Brass Inc., Detroit, is a 10,000-pound heavy-duty fork truck which provides a flexible means for transferring brass slabs and billets from molds to slab shears or billet saw and on through the mill.

Shown in accompanying illustrations, the truck is of the front wheel drive type with controls in the center. Rating of the forks is 360,000 inch-pounds. Total lift is 60 inches and the lifting mechanism tilts back through an angle of 25 degrees. Power steering facilitates maneuverability. An 18-cell storage battery supplies power and in steady service the truck ran be operated about 16 hours before requiring a recharge; however, it is the practice to remove bateries after 10 hours of active duty.

The Revere company makes a wide range of brasses for both strip rolling and the manufacture of rod; most of which is melted in a battery of induction furnaces. After casting, the slabs or billets are placed on steel racks directly in front of each



Above, heavy brass slabs are placed, on edge, on chain conveyor which transfers them to a cropping shear. Left, fourteen billets weighing about 11,500 pounds are being placed on a gravity conveyor down which they roll to a saw which gates and cuts them to length for processing

MATERIALS HANDLING

furnace so that each caster's work can be kept separate.

Twice each shift the work of every caster is picked up by the heavy-duty fork truck and stored in a space provided for until check analyses are prepared by the laboratory.

A laboratory assistant marks each slab or billet and releases the metal for gating or sawing. In the case of slabs, they are picked up and placed on a table leading to the shears and are gated or cropped on the top end for inspection as to soundness. At this point, the off-mixture and unsound castings are rejected and returned to the casting shop for remelting, while the good slabs are again stored on racks ready for breakdown rolling.

Billets are likewise placed upon a table leading to the billet saw where they are gated, that is, the top end is removed to inspect the casting for soundness and are also cut into the required lengths for extrusion.

One of the illustrations shows the truck about to lower a load of billets on the table down which they roll to the saw. The load shown on the forks is approximately 11,480 pounds.

The second illustration shows the truck depositing a load of slabs on the table leading to the slab shear.

The heavy-duty truck has proved to be a highly flexible medium of materials handling. While an overhead crane is available to handle the billets if the truck should be disabled, operating executives of the company lean toward the use of electric trucks as the more flexible means of moving the product. A fleet of smaller trucks is operated throughout various other divisions of the plant. Both material being processed and scrap are moved by the group of platform truck, steel skid platforms serving to carry the material.

Below, welded steel racks for heavy bar storage, constructed from standard channels, H-beams, I-beams and plates, are used in the new machine shop of Chain Belt Co., Milwaukee. Left, removable dovetailed plate "keepers" prevent bars from rolling. To remove or place bars, extensions are added to the ends of the trimmed I-beams which added about a foot to the length and permit access by crane

Heavy Bar Stock Stored In Special Floor Racks

■ Heavy bar steel stock at the new machine shop of Chain Belt Co., Milwaukee, is stored in special floor racks where each type and size of steel is kept separate. By the use of a special attachment, as will be described later, any kind or size of stock is easily placed or removed by the overhead crane.

In the construction of this unit two 12-inch H-beams are set vertical and each welded to a pair of 12-inch I-beams placed on edge on the floor. These H-beams form the two vertical standards which are set about 8 feet apart. The bars of steel rest on two horizontal pairs of 4-inch I-beams tack welded to the sides of the H-beams. Each pair of I-beams are supported on two short sections of ½-inch plates set on edge between the horizontal pair of I-beams is supported on opposite sides of the H-beams and to the I-beams. Thus the weight of the loaded I-beams is carried by these plates on edge rather than relying on the welding of the I-beams to the H-section. This welding, however, prevents a "shelf" tipping.

Bars are held from rolling by two short stops made from pieces of ½-inch steel notched or "dovetailed" to slide easily over the ends of one of each pair of I-beams. The other I-beam in each pair is cut at the end, as shown in the close-up view. A short section of ½-inch flat bar about 1 foot long with two ¼-inch bars bolted and welded to each side and extending out about a foot, leaving an opening between the thickness of the web, is slipped over the end of the I-beam on the rack. This extension is similar to the fishplate connection of two railroad rails, except that it is not bolted at one end.

To remove a bar of steel these extensions are slipped over the ends of the two I-beams and the dovetailed "stops" removed from the

(*Please turn to Page* 73)

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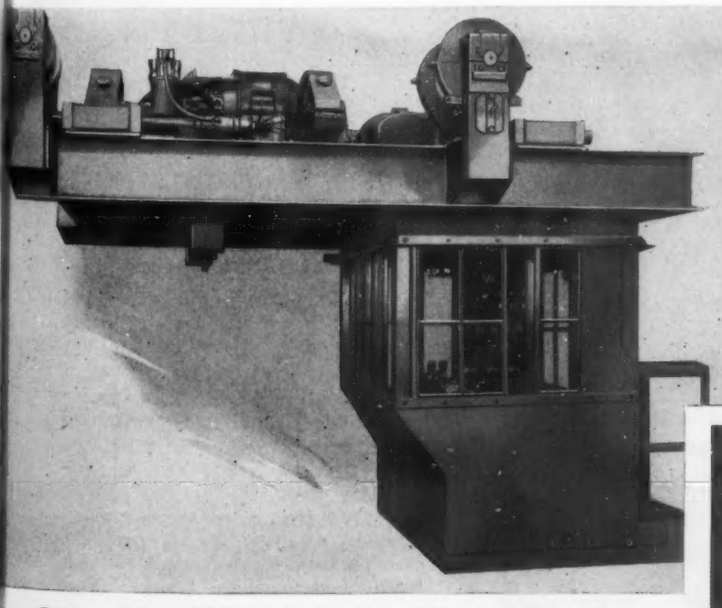
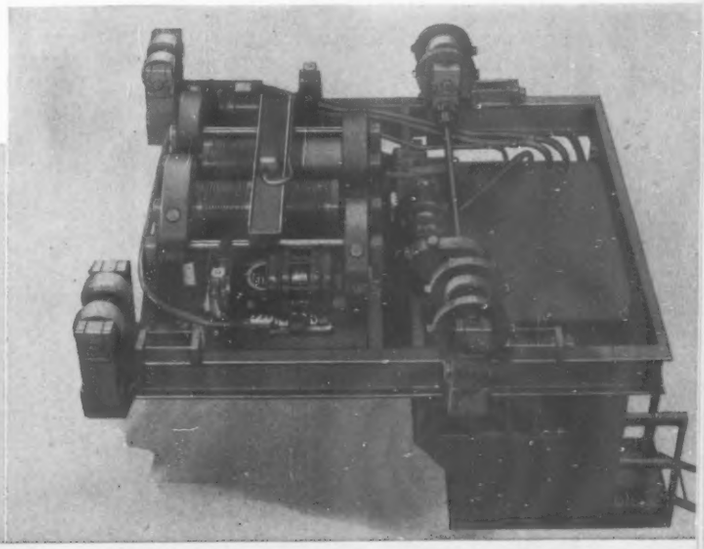


An Underslung 2½ Ton Bucket Trolley with cage attached.



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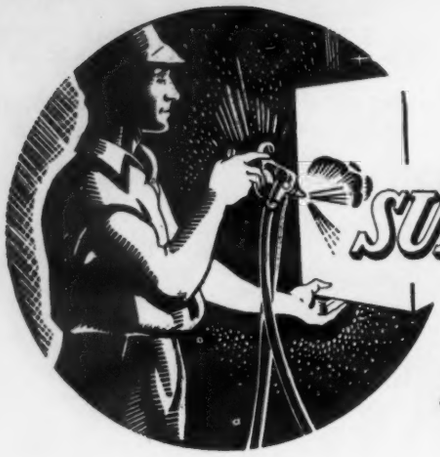


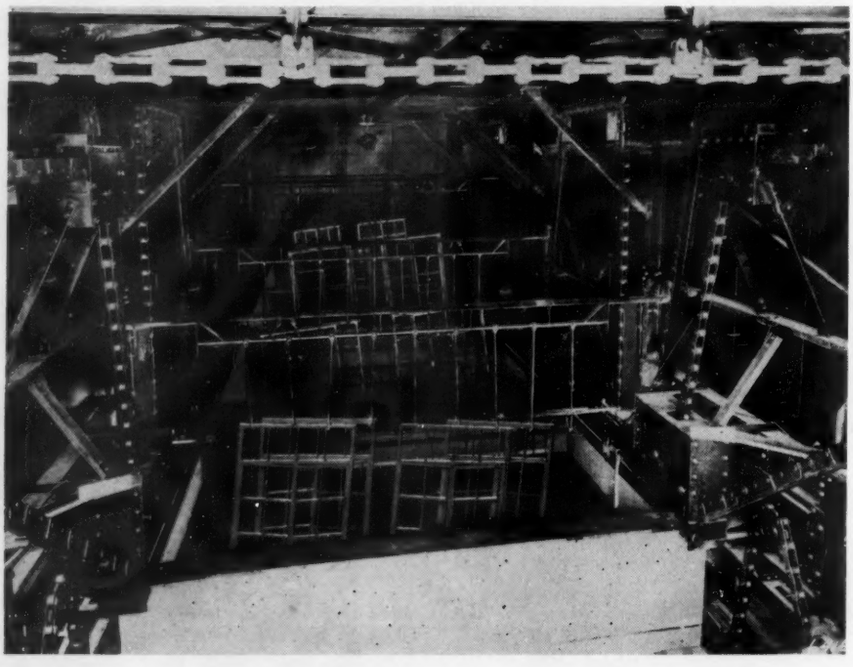
SURFACE TREATMENT AND FINISHING OF METALS

Steel Windows Cleaned, Rustproofed, Painted in Continuous Operation

■ RECENT installation of cleaning and rustproofing equipment has been made by Detroit Steel Products Co., Detroit, for improving and speeding up finishing operations on its well-known Fenestra type of steel casement window for residences. A new building, 40 by 234 feet, two stories in height with basement and sub-basement, has been erected for the work, cost with equipment amounting to about $200,000. Finishing of these windows now includes eight separate and distinct steps, as follows:

1. Cleaning in hot alkali solution to remove oil, grease and other foreign matter.
2. Rinsing in hot water to remove any traces of hot alkali.
3. Submersion in Bonderite rustproofing solution for a definite period.
4. Rinsing in cool water to remove excess salts from preceding step.
5. Rinsing in dilute chromic acid to provide an improved paint base.
6. Air drying to insure perfect dryness and uniform temperature before painting.
7. Dip painting at uniform controlled temperature.
8. Oven baking to dry and toughen priming coat of paint.

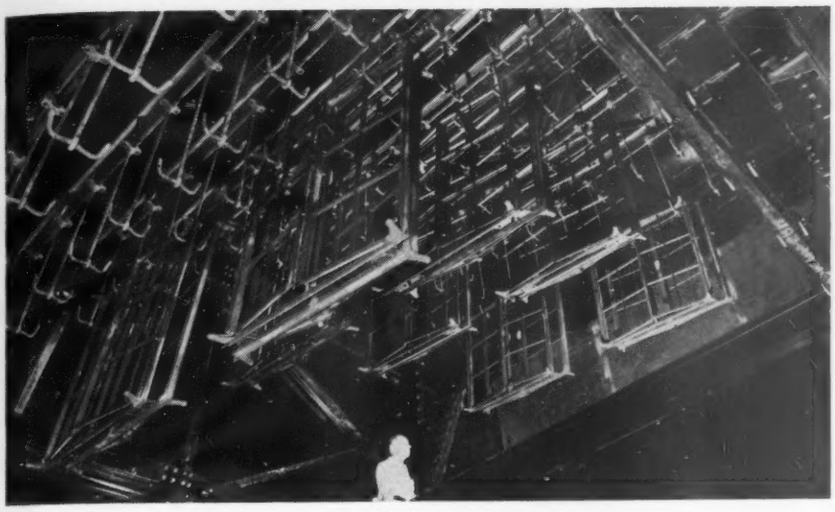
This type of steel casement window is made up of solid, rolled steel sections which are cut, machined and assembled into frames. Corners are welded; other sections are held by a patented type of clip joint.



Four 7000-gallon tanks contain, in succession, hot water, bonderizing rustproofing solution, cool water and hot dilute chromic acid. Nonmetallic, insoluble, crystalline phosphate surface, which holds subsequent paint, is formed

Pressure Cleaners Used

After wire brushing, assembled units are hung on an overhead process conveyor with swing leaves locked in an open position, and then transferred to a 57-foot cleaning tunnel. This tunnel is 6 feet wide and 17 feet high. As the windows pass through edgewise, 400 pressure jets of hot alkaline spray, played from both sides of the tunnel, thoroughly soak and loosen all dirt



Chain conveyor carries the rustproofed window frames through this 25-foot high cooling tower before paint dipping

which subsequently is washed off by clear hot water from 200 additional pressure jets.

Emerging from the cleaning tunnel, the windows, still on the conveyor, make a right angle turn and are transferred from the process conveyor to a transverse conveyor which carries the frames through the bonderizing tanks. This transfer is accomplished automatically.

An accompanying illustration shows these transverse conveyors moving rows of frames through the four 7000-gallon tanks. Chains on either side move the product progressively into and out of the four tanks.

The first tank contains clear, hot water, temperature maintained at 200 degrees Fahr. by heating coils along the interior of the tank walls. A dip of 72 seconds heats the window to the proper temperature.

The second tank contains the rustproofing chemicals maintained at a temperature of 180 degrees Fahr. Immersion in this solution is 3 minutes. Mechanics of the Parker Rust Proof Co.'s bonderizing treatment are well known, involving a chemical action with the steel surface to form a nonmetallic, insoluble phosphate crystalline surface microscopically "toothed" to hold subsequent paint.

The third tank contains cool water in which the windows are immersed for 72 seconds to remove excess rustproofing solution.

The fourth tank contains dilute chromic acid solution held at 200 degrees Fahr. in which the parts are dipped for 3 minutes.

From the fourth tank the windows progress through a blowoff chamber where a workman with an air hose blows off the moisture which collects in the frame and ventilator corners. The conveyor system then takes the windows on up to the cooling chamber or tower which extends 25 feet above the floor. Passage through this tower requires 15 minutes, in which interval temperature of the product drops from 200 degrees to 95 degrees. At this point, still on transverse conveyors, the frames are carried to a 3500-gallon paint tank, maintained at a constant temperature of 95 degrees, in which they remain for 1½ minutes to receive a gray priming coat.

Special Paint Developed

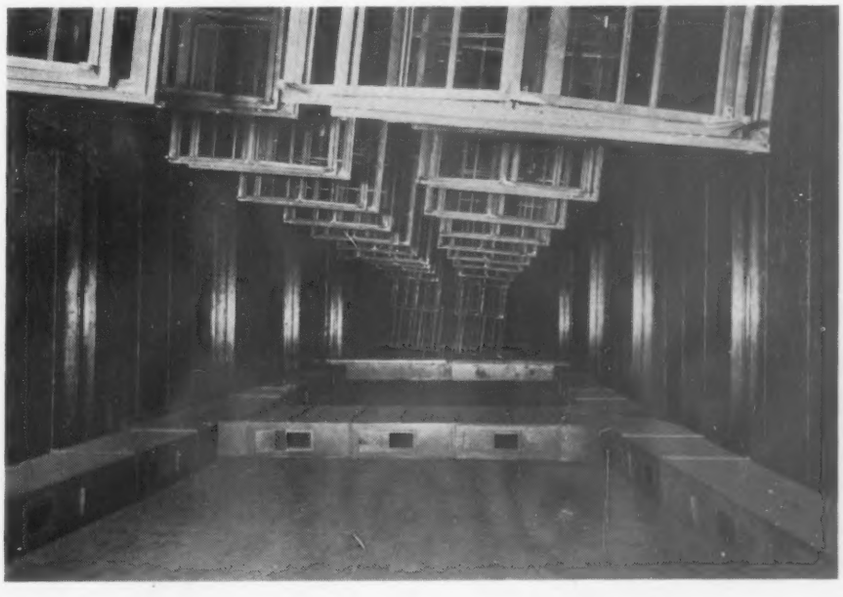
Special paint was developed by engineers of E. I. duPont deNemours & Co. Inc. for this work. Pigments include basic lead chromate and other high-hiding materials; the vehicle is a mixture of heat treated linseed oil and chinawood oil tempered with the proper amount of resin to produce a baked film possessing good adhesion, flexibility and moisture resistance along with the required hardness to withstand handling and shipping.

Each evening the paint is drained back into three large agitators in the subcellar where it is thoroughly mixed and tested for use the following day.

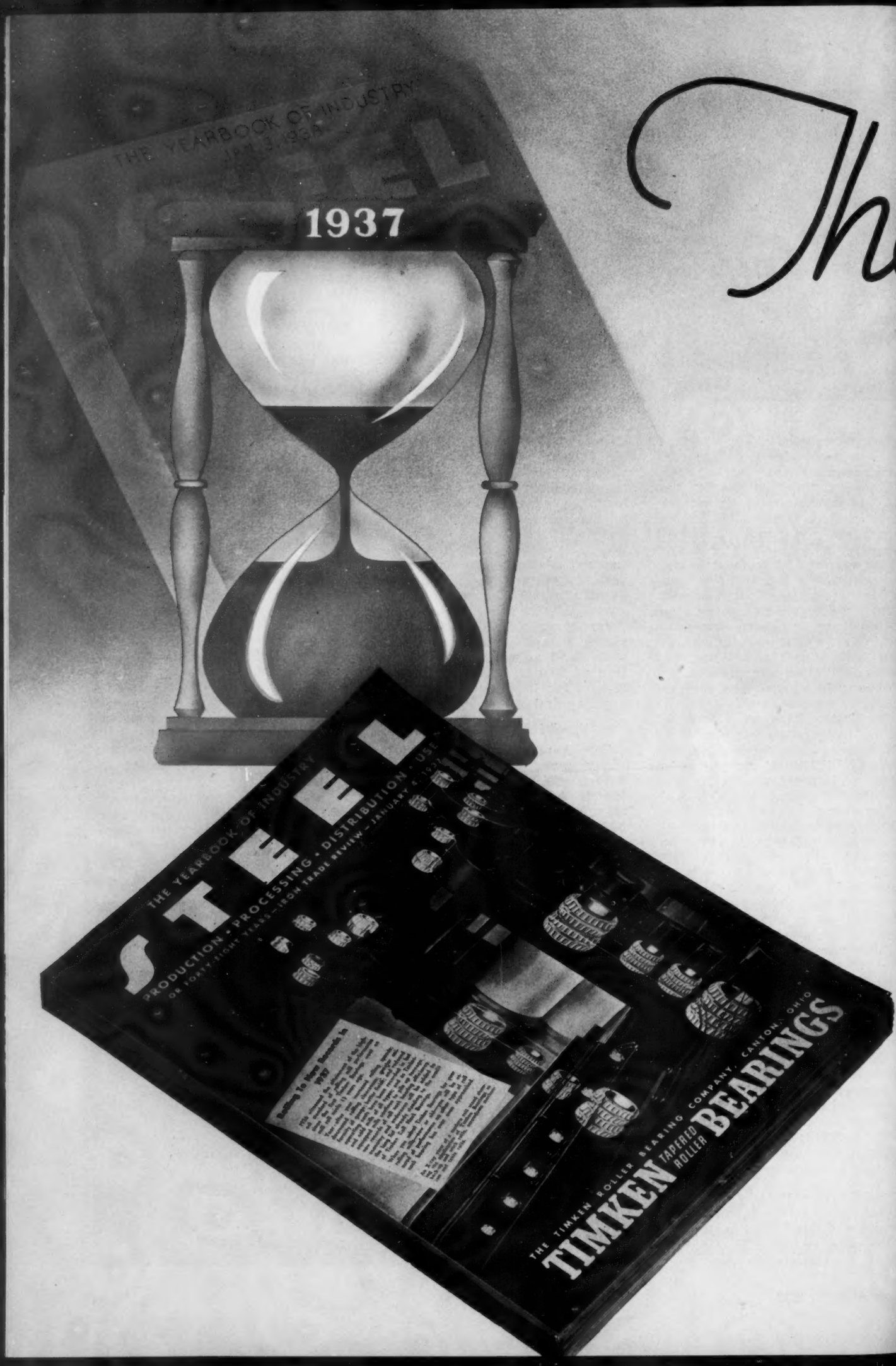
Carried upward again after their dip into the paint tank, the windows travel through a 74-foot horizontal baking oven through which air at a temperature of 300 degrees Fahr. is forced from conduits in the floor and out through apertures spaced several feet apart so that during at least 30 minutes of the 45-minute trip through the oven the windows show a temperature of 300 degrees. Automatic controls regulate the temperature and hold it constant within plus or minus 2 degrees.

At the oven exit, the windows are carried down almost to the floor and then up again for 28 minutes of air cooling while the conveyor travels a high arc and delivers the product again to the process conveyor on which the journey through the finishing processes began. As the finished windows are removed from the conveyor, spacer clips are removed, grease is applied to adjuster guides, swing leaves are closed and shipping clamps are applied.

The complete finishing treatment, said to be the first instance of rustproofing steel windows on a production basis, requires 2 hours and 15 minutes.



Air at 300 degrees Fahr. is forced through apertures in the floor ducts of this 74-foot baking oven, windows requiring 45 minutes to traverse the oven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TIMKEN TAPERED ROLLER BEARINGS

The Sand Runs Out

THE YEAR is drawing to a close. The 1937 Yearbook of Industry issue, which has served and is continuing to serve well, will soon have lived its life. But . . . there's a new Yearbook issue coming to replace that which has become worn and dog-eared from much use.

» » The January 3, 1938 Yearbook issue will surpass the old as the old surpassed its predecessors. It will contain all of the time proven features of previous Yearbooks, all of the departments of current issues amplified to fit the occasion; plus much valuable information attuned to the times and future needs. All of this material will be presented in the usual easily accessible manner which makes STEEL'S Yearbook issue of such great value as a reference volume.

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STEEL'S 1938 YEARBOOK ISSUE

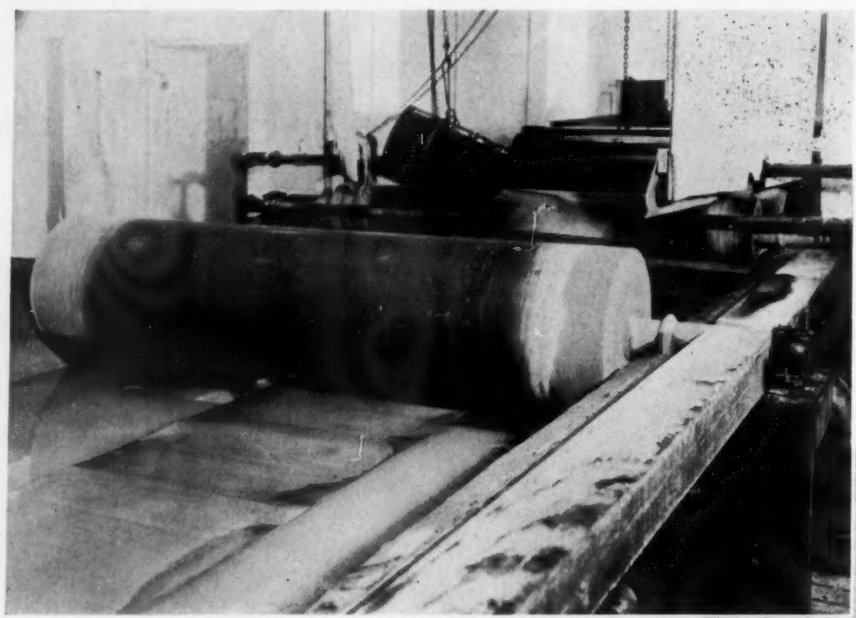
PROGRESS IN STEELMAKING

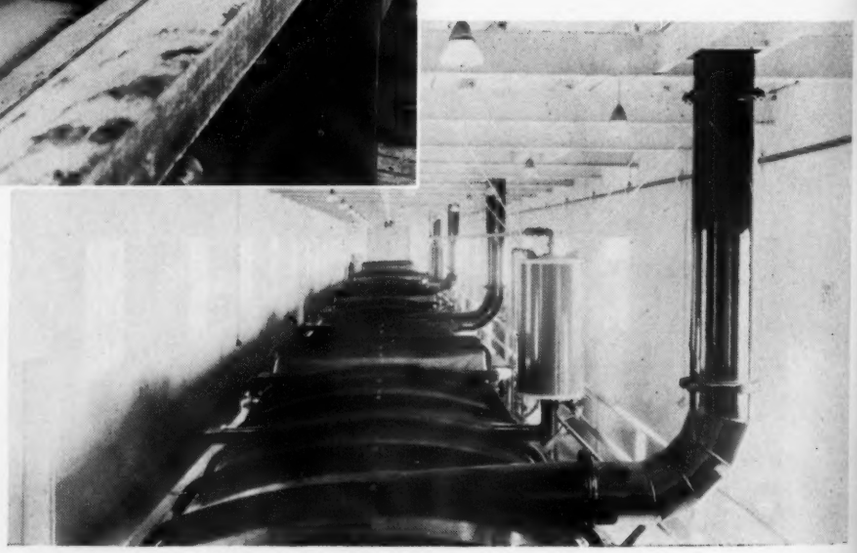
Compact Design of Pickler Makes Space Savings Possible

■ SINCE the continuous strip sheet pickler is a comparatively new development in the steel industry, companies are frequently faced with the problem of fitting this equipment into a limited space to avoid the necessity of making costly plant additions. Such was the case at one large mill where the space between the existing buildings housing the coil storage and cold rolling departments made it impossible to install a pickling unit of standard length.

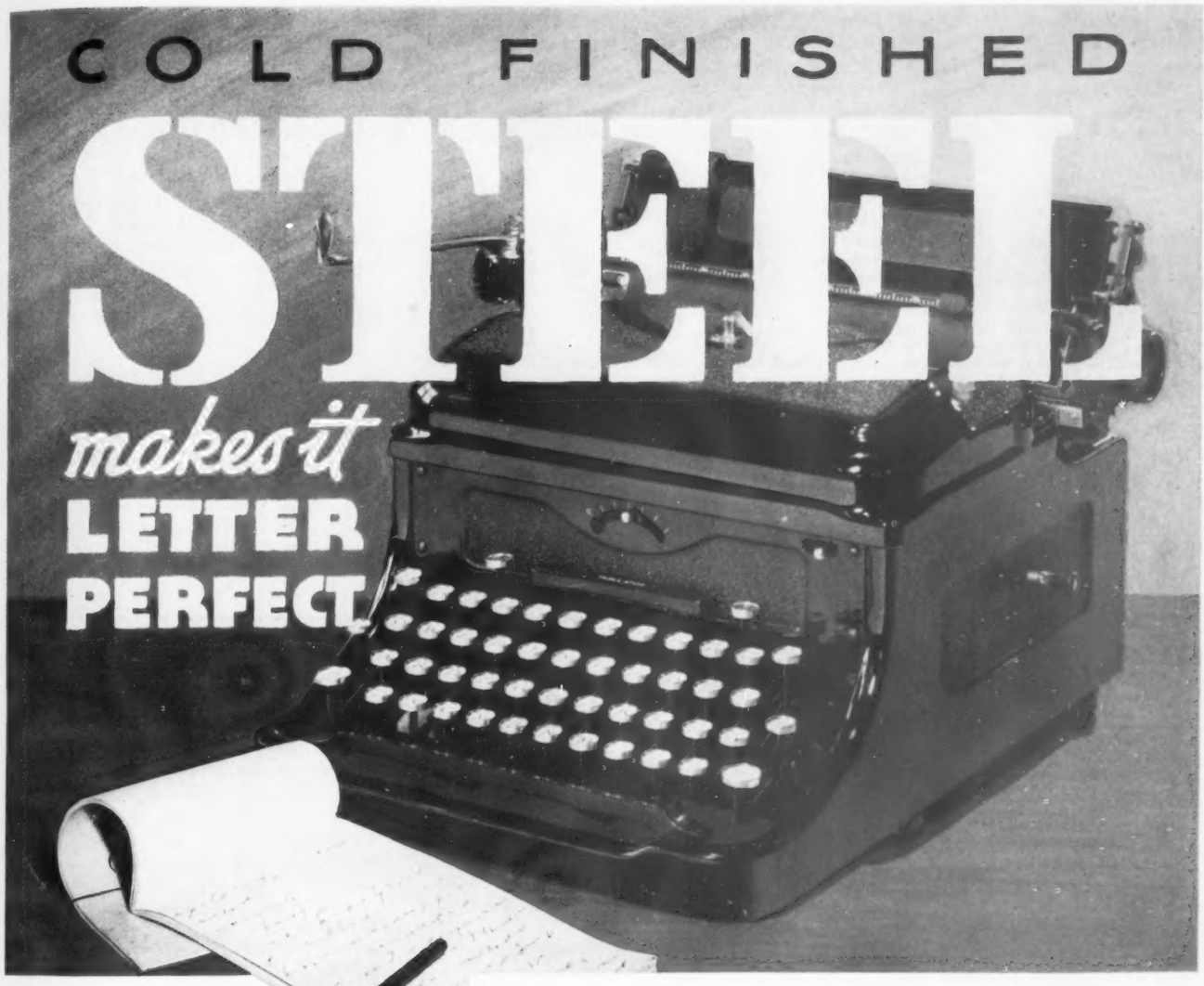
The problem was solved satisfactorily, however, by means of a unique tank design. Instead of using four separate pickling tanks, a single steel tank approximately 200 feet long was made up in five flanged sections and assembled on the job. This tank was lined with ¼-inch rubber by The B. F. Goodrich Co., Akron, O., and then sheathed inside with 8-inch brick jointed with sulphur base cement. Then by installing brick partitions the interior of the tank was divided into four separate acid compartments, each measuring approximately 50 feet long x 100 inches wide x 4 feet deep.

The steel strip is carried on 12-inch diameter rubber-covered rolls which are mounted on tank at ends and over each partition. Tank covers and fume ducts are of rubber-lined





Rinse tanks, above, are equipped with 22-inch rubber covered hold down rolls. The complete unit, right, is housed compactly in a specially designed building



The most used and abused machine in the average office is the modern typewriter .... the entire business of the firm is transcribed on its busy keys.

That means hundreds of strokes for a page letter or about a million hammer taps on its delicate mechanism every month. Yet it keeps going year after year with amazing stamina.

How can it stand such punishment? . . . It's the stuff it is made of . . . Cold Finished Steel to give extra strength and wear resistance to the vital parts and keep them in permanent alignment for doing a letter-perfect writing job throughout the life of the machine.

Common-sense dictates the use of quality B & L Cold Finished Bar Steels for the working parts of typewriters, comptometers, cash registers, multigraph, dictaphone equipment, and other business machines.

B & L engineers will gladly work with you in determining the proper grades of carbon and alloy steels for your products.

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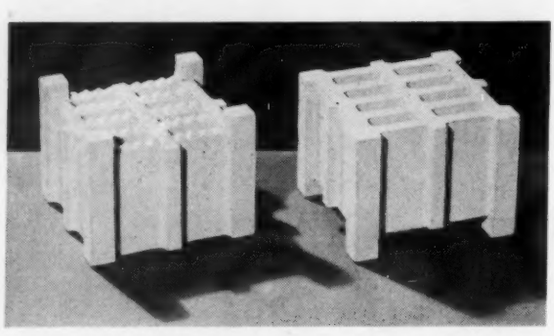
steel construction. Each acid compartment is equipped with a combination syphon and overflow device which maintains proper liquid level at all times.

Separate rinse tanks of similar design, equipped with 22-inch diameter rubber-covered hold-down rolls complete the installation. The whole unit is housed compactly in an especially-designed structure equipped with monorail crane to handle all of the cover sections and rollers.

New Ceramic Packing Is Designed for Gas Washers

■ To fill the need for an efficient method of washing, reclaiming and cooling gases, General Refractories Co., Philadelphia, has designed and patented a new type of ceramic packing known as GRCO Drip Point Grid Tile. Its more important applications include blast furnace gas washers, coke and gas scrubbers, acid concentrating towers, chemical absorbing towers and cooling tower packing. The drip point design is shown in the accompanying illustration.



Top and bottom views of the new refractory designed by General Refractories Co. In use, the tiles are stacked with points down as at right

The new tile is made of a dense and acid-resisting fireclay brick possessing high physical strength and permits low first cost construction with assurance of efficient operation and long life. The product is non-absorbent and rigid and builds up into self-supporting structures. Being a refractory, its use eliminates the fire hazard which exists when wood packing is employed. With the new tile, it is claimed, there is no guesswork as to the extent of the effective scrubbing area since this may be predetermined exactly.

Indented paneling on all sides is said to provide maximum effective surface. The liquid drains by dripping from the points on the bottom of each tile onto the tile below. Location of the points makes it impossible for any liquid to bypass any portion of the packing. Each tile has ample openings bounded by surfaces on which the rising gases contact the washing medium. The legs are so designed as to create spaces between the tiles through which the washing liquid drips and flows freely. These spaces, it is stated, also create a perfect balance of gas pressure, thus eliminating the possibility of flue action to cause the gas to channel or bypass any particular section of the packing.

Eliminates Disturbances

■ Because of the wide and sudden swings of load at steel plants, which obtained their power from public service companies, voltage disturbances frequently are created. One steel producer has been able to overcome this tendency by over excitation on the motor-generating set synchronous motors during the peak loads. By this arrangement the reactive component in the line is automatically varied as a function of load and voltage is held close to normal.

Bloomer Uses New Control

■ Variable voltage control will be used on a new blooming mill now under construction in this country. This is the first installation of 3-field "shovel-type" generators ever employed for such a purpose. The generators, which have differential series fields and two shunt fields, are assembled in two 5-unit motor-generator sets, each consisting of 1000-horsepower synchronous motor, three 135-kilowatt generators and one 250-kilowatt generator. Under ordinary practice of rheostatic control a large amount of maintenanace would be involved in the operation of 80 large capacity contactors which would be required in handling a fast cycle of 16 passes per minute. In this case, however, the control for field circuit comprises only comparatively small contactors. These auxiliaries are faster and have much more power at high operating speed.

Adjustable Voltage Used

■ A novel arrangement is employed at a merchant mill in the Chicago district for driving the flying shear. The shear, which is synchronized mechanically and follows the last finishing stand, crops the ends of the merchant sheets to length ranging from 6.6 feet to 25 feet at delivery speeds of 500 to 1000 feet per minute. The 100-horsepower, 475 revolutions per minute motor is operated up to 1000 revolutions per minute by stepping up the voltage to about 500 volts. The motor is driven by a separate motor-generator set, the voltage being adjusted by generator field control.

Reduces Piping in Ingots

■ Light-weight hot tops for ingot molds weighing about 70 to 75 pounds, have been made by the introduction of coal, sawdust and other materials which will burn out during the firing operation. This type hot top reduces the expense involved in handling and has a better effect on the piping since it is a better heat insulator and has a lower heat capacity. Such tops have a tendency to adhere to the steel if open pores are present on the inner surface.

Rod Mill Motors

■ Two special synchronous motors, each 4500 horsepower and with an operating speed of 400 revolutions per minute, now are employed for driving two rod mills in the Chicago district. High torque efficiency is of prime importance at this particular plant because of limited power and high torque conditions. By means of a refined design, but with no radical departure, a high torque current efficiency of 44 per cent is obtained. The totally enclosed motors are mounted in the mill rather than in the motor room. Each motor is maintained at operating temperature by surface coolers built in the base of each housing.

Cleaning Air With the Electrostatic Precipitator

■ REPRESENTATIVES of various business papers were guests of the Westinghouse Electric & Mfg. Co. at Chicago recently to inspect equipment that is providing the Field building with what is termed the "cleanest air in the world."

This equipment, known as the Precipitron, cleans air by an electrostatic process developed by the Westinghouse research laboratories. More effective than mechanical methods, it removes up to 99 per cent, by weight, of all particles in the atmosphere, even those which are as small as four-millionths of an inch in diameter and almost submicroscopic.

Is First Installation

In the Field building, the first to have an electrostatic installation, the Precipitron operates in conjunction with an air-conditioning system to service the building lobby and lower four floors. Eighteen units have been installed which are capable of cleaning 272,000 cubic feet of air a minute. In a year's time, it is estimated, the installations will have collected about 600 bushels of impurities, 90 per cent of which will be particles one-hundredth the diameter of human hair.

Although the electrostatic cleaning of air has proved successful in eliminating the cause for most of the dirt and grime that accumulates on walls and ceilings of offices and homes, commercial applications also have been found and others are in the process of development. The first commercial installation of any magnitude was for the recovery of glaze in automatic glaze spraying machines at the Homer Laughlin China Co., Newell, W. Va. Another application is for cleaning the gas for steel plant furnaces in order to prevent the burner nozzles from clogging. Experiments are being made in the removal of dust from foundries and in the recovery of porcelain enamel from the atmosphere of spray booths.

While the initial cost of the Precipitron is a little greater than that of mechanical filters, it performs an additional service in removing high percentage of extremely fine dust particles which escape through other types of filters. Even smoke particles are removed easily by this device.

The Precipitron consists of three parts: The ionizing unit, the collector cell and the power pack. The ionizing unit is essentially a fine wire centrally located between two grounded rods with a potential of 12,000 volts direct current applied between the wire and the tubes. The air to be cleaned is passed through the ionizer where the particles of dust accumulate an electrical charge.

The particles then are carried into the collector cells which consist of a series of flat plates mounted in a case. In the Field building installation the plates are aluminum. Selection of material for the plates depends on the character of the dirt to be collected, metals having been employed including brass, monel metal, stainless steel and Cor-Ten.

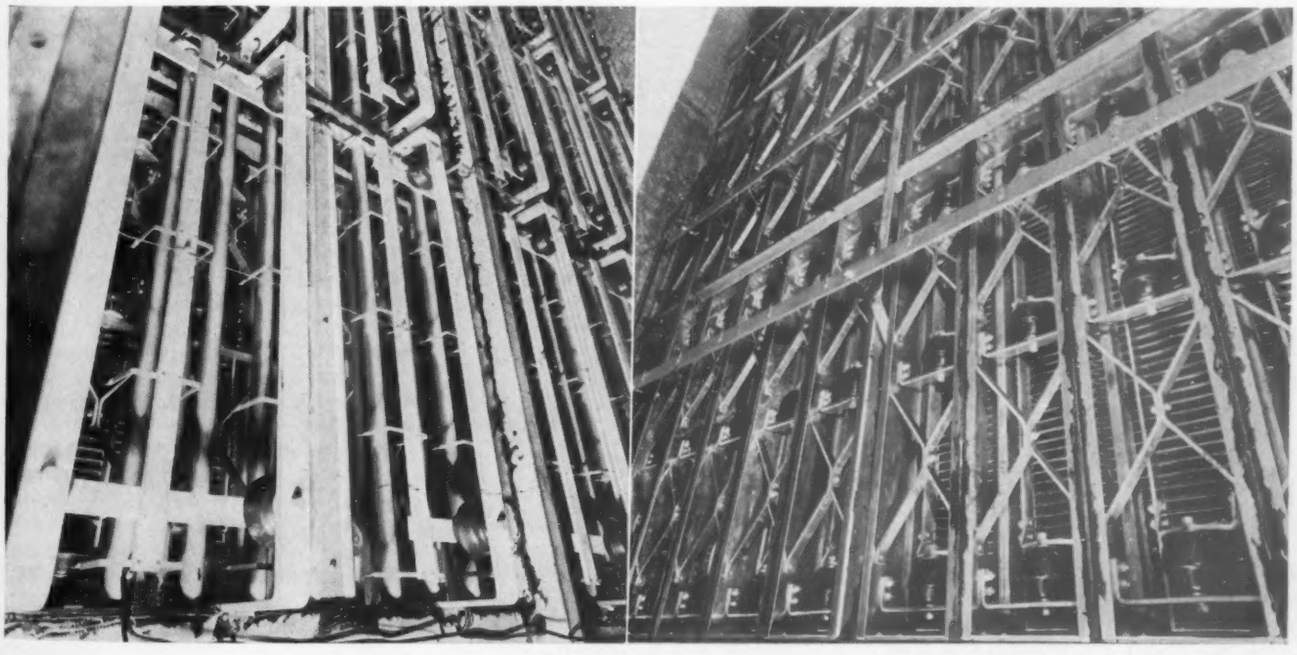
Principle Involved

The plates are spaced 5/16-inch between centers and a potential of 5000 volts direct current is applied between adjacent plates. When the dirty air enters the plate structure, the force of the electrostatic field draws the charged particles to the collector plates much as a magnet attracts a steel filing. The dirt then gives up its charge and is held on the collector cell plates by electrical adhesion.

Voltage for the ionizing unit and the collector cells is obtained from the power pack which is a combination of transformers, rectifiers and capacitors designed to be supplied from ordinary 110-volt, 60-cycle, single-phase line. Power to clean 3000 cubic feet of air per minute is less than 100 watts and for cleaning 30,000 cubic feet is less than 500 watts.

As dirt accumulates on the collector cell plates, they may be washed periodically, allowing the insulation to dry for 15 to 20 minutes before applying the ionizing potentials and placing the plates back in operation.

Left view is entrance of new precipitator units, where dirty air starts through. View at right is the opposite side, where the air is discharged after cleaning



WELDING, ETC.

BY ROBERT E. KINKEAD

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

U-68 Pressure Vessels

■ Welding of power boiler drums and pressure vessels of similar responsibility is carried out by a technique representing the ultimate in safety requirements.

Formerly called Class 1 welded construction, it is now known as specification U-68 of the ASME Power Boiler Code. After some seven years in force, this specification may be reviewed with reference to its effect.

Outstanding is the result that fusion-welded vessels are accepted without question when made in accordance with these requirements. There is little doubt that welding is more universally accepted in other applications because following of this specification has shown that welding is actually safe beyond the shadow of a reasonable doubt. These effects have all been on the good side and sufficiently strong on that side to overbalance by a wide margin all disadvantages. But there have been disadvantages.

The requirements of the U-68 specification have resulted in practically freezing the methods by which such welds are made and stopping progress in cost reduction. Manufacturers who have equipped to do this class of welding quite naturally oppose any new and better method which might obsolete their existing equipment and upset the price structure of their industry. And there is reason in their plea that conditions remain fixed until they can at least amortize part of their investment in the expensive equipment required by this class of plate fabrication. But there is a limit to how long such conditions can be held under control, no matter how strongly the members of the industry may individually and collectively oppose change. Someone will eventually jump the traces and do a better job for less cost; then the jig is up.

At least three welding methods, other than the one used to meet U-68 requirements, promise reduction in cost and, in two out of the three, better metal in the weld. By the time business conditions change for the better, it is quite likely some very serious consideration will be given the matter of reducing costs and increasing sales thereby. Otherwise, the industry might just as well ask Mr. Roosevelt for one of his New Deal administrators to run its affairs into the ground instead of doing it themselves.

Invest in Developments

■ Field for development among the welding processes is as promising as any field, with the possible exception of industrial chemistry.

This arises from the fact that progress in chemistry, metallurgy, and electrical engineering is rapid and then advances in welding are based on progress in these fields. In the search for places to invest capital, development and research in welding should receive consideration.

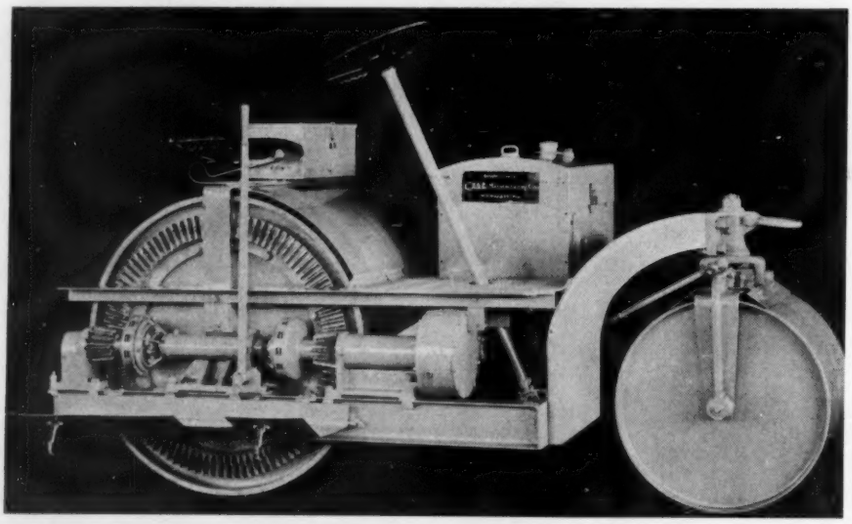
But there is a vast difference between development work that gets results and the kind of formalized research frequently encountered in industrial plants. In many cases, the president of a company will establish a research department because everyone has told him it is a good thing, and will then forget about it until he encounters a problem he cannot solve in mathematics because he has forgotten what was in his college text books. He will call in a shark from the research department and get an immediate answer.

Such a department soon gets the idea that is about all expected of it and the money the department spends is wasted. There are probably more research departments in this country that need revitalizing than the engineering colleges would like to acknowledge. The fact remains that a research department can go to seed faster than almost any other department in an organization.

Research is an incident in development of new processes and products. Development is the valuable work. Production of a product which can be sold in quantity for more than it cost is what industry wants from research and development.

Capital that is invested in the welding industry as a result of new developments is shown by experience to be safe and the returns have proved to be highly satisfactory.

Two-Ton Roller Has Welded Construction



■ This two-ton tandem roller, manufactured by C. H. & E. Mfg. Co., Milwaukee, is almost entirely of steel construction. Frame and structural parts are of welded steel construction. Rollers are constructed of steel plates which are rolled and welded, and steel side plates are also welded in

POWER DRIVES

Antiquated Distribution Systems Still in Use

■ Too often there is a tendency to consider the power distribution system satisfactory as long as it feeds enough power to the machines to keep the wheels turning.

Feeder lines and incoming control equipment, however, have a fixed maximum safe capacity. With demands beyond these points the feeders heat, control equipment frequently operates at points of peak demand thus interrupting service, low voltage decreases the speed of motors, power-wasting grounds may exist, and repair and maintenance of lines and control equipment increase. Also, the system has no reserve capacity for overloads. Disastrous fires are a possibility, as insulation on old lines deteriorates rapidly with heating from overloaded circuits.

Distribution lines and incoming circuit controls may have represented the latest development when they were installed ten or fifteen years ago. Probably many machines have been added since then, thereby increasing the load and requirements. The overloaded lines are wasting money, causing trouble and are dangerous.

The practice of patching them up here and there is questionable from an economic standpoint. Sooner or later they will be beyond patching and must be entirely replaced. The money spent for repair is then wasted and could have been used to better advantage in the rehabilitation of the entire system. It is said that 90 per cent of industrial plants could make important savings by a moderate investment in up-to-date wiring and make their plant safer at the same time.

When a system is found inadequate, the plant engineer should consider all possibilities from the incoming connections and voltages up to the machines. Perhaps, since the original installation, the power company has extended a high-voltage line within tapping distance of the plant. With sufficient power demand it may be an advantage to include the necessary transformer equipment to use this.

Modern metal-enclosed switch units and control panels have distinct advantages over old-type installations in compactness, safety, instrumentation, accessibility of wiring, interchangeability of disconnect units, ease of removal for repair, ease of connection and minimum of wiring at time of installation. These units are complete and can be made ready to go almost as soon as set in place.

Conduit Is Minimized

Long runs of individual conduit may be avoided by the use of box or duct distribution systems, necessitating only short runs to each motor. When a machine is moved it can be connected up again quickly in its new location with a minimum of conduit to remove and install. Machines may be added easily as these ducts may be connected into at points only a short distance apart.

These box and duct lines were developed originally for automotive plants where machines are frequently shifted, but have shown numerous advantages, even where only a few changes are made, by providing for easy addition of equipment.

Future demands and probable requirements must be taken into account in planning or an installation may be inadequate within a short time. This planning includes the present and probable future tendency of modern machines to use motors of larger rating and power requirements. Replacing a worn-out machine with a modern unit even of the same size and make requires entirely different power supply.

A machine tool of any price is idle when the power supply fails; it does not serve its expected purpose when the power supply is inadequate. Distribution and feeder circuits are, therefore, as important as the machines they supply. Modernizing one is not enough to guarantee increased production if the power supply cannot supply the increased demand.

Belts Are Expensive Saws

■ In a plant recently visited a belt had sawed a groove almost 2 inches deep in a 6 x 6-inch timber. How many belts had been worn out on this unnecessary task is unknown. The cost of even one belt, its installation and maintenance would have paid for moving the drive so that it did not rub.

Many plants show examples of worn belt shifters or partially sawed-through wooden blocks set to keep a belt from running off a pulley. Naturally belt life is short and maintenance excessive on these drives.

Belts running to one side are usually due to one or more of three conditions. Of these misalignment of pulleys is the most common. Either they were not aligned properly in the first place or a pulley has shifted. Both are easily corrected. The same is true with mis-

aligned or improperly set shifter arms.

Another cause is the use of cheap belts which stretch unevenly and run crooked. Replacement is the only cure for this trouble as the belt, even if rebuilt, will stretch and run uneven again. Also, misalignment will cause a good belt to stretch unevenly as stretching is its natural method of compensating for misalignment. Sometimes determining which is cause and which effect is difficult to establish without checking the drive installation and testing quality of leather.

Too much or too little crown on the pulley may result in the belt being too hard to shift or weaving on the pulleys. In either case the belt rubs the shifters the same as when they are not properly set.

All of these conditions are easily corrected and at much less expense than the maintenance and replacement cost of using belts to saw wood or metal.

♦

To prevent a high demand peak at starting time one plant staggers starting. The largest motor, of the synchronous type, is started first as it draws the heaviest current. The other larger motors on group drives are started individually next. Not so much attention is placed on starting time of the smaller motors and individually-driven units.

Plant Transfer Brings Economic Advantages

■ Transfer of plant and offices of Penn Electric Switch Co. to a new group of especially designed and constructed modern industrial buildings at Goshen, Ind., is a significant illustration of the current trend of industries toward centers of more economical manufacture and distribution.

Founded in 1918, the company had previously been located in Des Moines, Iowa, where it had approximately 350 employes on its payroll.

New factory site, selected after a careful study of a number of possible locations by Penn executives and engineers of The Austin Co., Cleveland, which designed and erected the buildings, is expected to save the company a substantial amount in freight on raw materials alone. This does not take into account the savings to customers, many of whom are located within 150 miles of Goshen, in cities readily accessible by motor truck as well as rail. They include the country's largest manufacturers of heating, refrigeration and air conditioning equipment, pumps and air compressors for whom the Penn Electric Switch Co. developed a variety of automatic controls.

New plant development includes a two-story office building, 42 x 118 feet, with penthouse recreation room, and a one-story, monitor type factory building 210 x 340 feet completely enclosed by continuous sash, insuring maximum daylight throughout the working area. In a connecting building, 20 x 90 feet between factory and office, are housed the engineering offices and immediately back of that, in the front section of the factory, is the experimental department.

Factory working area is laid out for straight-line production and handling of materials necessary in the manufacture of more than 40 different types of automatic control devices, many of which are as delicate in structure and adjustment as a Swiss watch.

Materials are received and products shipped over a single two-car loading dock which connects by private siding with the main line of the New York Central Railroad.

Machines in Rear

Stamping and machine operations are centered in the rear of the plant where vibration and noise can be sufficiently isolated to create a minimum of disturbance to employes throughout other parts of the plant and office buildings. The control assemblies are organized in adjacent areas and in close proximity to two testing rooms kept the year 'round at constant temperatures of 72 degrees Fahr. and 104 degrees Fahr. It is in these rooms that controls are calibrated and scientifically adjusted within fine limits of accuracy.

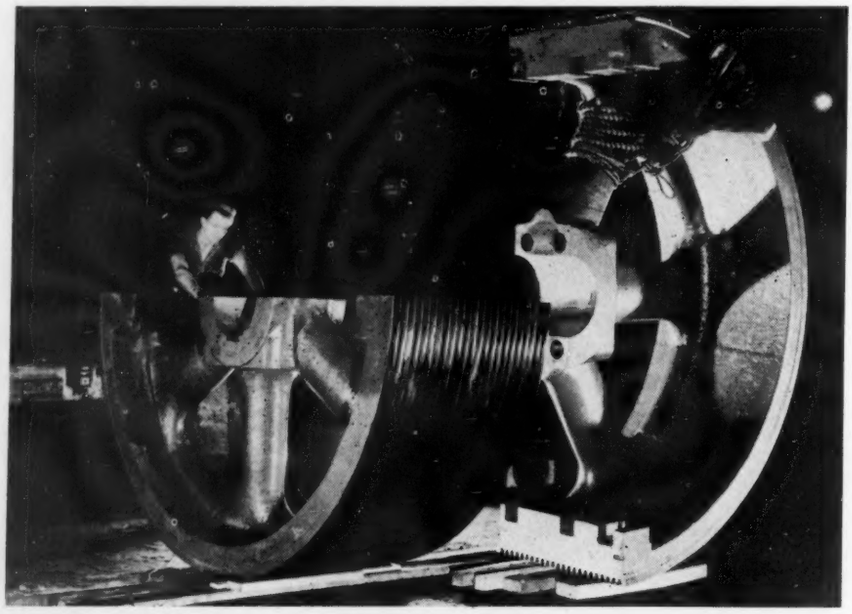
Soldering operations are centralized in a special room provided with heavy brick walls to prevent the spread of acid fumes into the rest of the factory.

Forced hot water for factory heating and steam for offices are furnished from automatically fired boilers housed in a 58 x 40-foot building. Heating and cooling units have been installed throughout the factory area, and water used for summer cooling is pumped to the roof where spray nozzles maintain a shower over the roof deck during the day to keep inside temperatures as low as possible.

Free flow of production is further assisted by the location of locker and wash rooms at mezzanine level in sections between the high monitor aisles. They are reached over open steel stairways leading directly from the working floor.

Record speed in the construction of the building was achieved through the use of structural steel, manufactured and carried in stock at the Austin fabricating shops in Cleveland. Placed under contract last November, the plant was ready for occupancy in the early spring.

Flywheel Sheave Weighs 45,000 Pounds



■ Sufficient weight is built into this 45,000-pound, 122.5-inch pitch diameter, 23-groove sheave flywheel to maintain momentum at 90 revolutions per minute on the shock load to a 60 x 84-inch jaw crusher. The resiliency in the 23 V-belts lessens the transmission of the shock to the 300-horsepower motor operating at 250 revolutions per minute. Photo courtesy Allis-Chalmers Mfg. Co., Milwaukee

Automatic Welding a Most Useful Fabrication Tool

■ Fabrication of steel products, machinery and other structures by various welding processes was the subject considered at one session of the recent annual meeting of the American Welding society held in Atlantic City, N. J., Oct. 18-22, in connection with the nineteenth annual National Metal congress. A considerable amount of interesting information was disclosed.

The art of automatic welding reaches its greatest height in seam welding, said Harry Landstrom, Nash-Kelvinator Corp., Grand Rapids, Mich. In this branch of resistance welding the automatic features determine the quality and speed of welding. Here any one of several factors may make or ruin the weld. A good welder, with the best of welding transformers can be ruined by the use of poor seam welder spindles and rolls. Bearings, with or without rollers, can be used but these must be held to very close tolerances to allow no deviation in the flow of current. Here the alloy manufacturers have produced metals in combination to fulfill these requirements much better than in past years, although there still is room for improvement.

Research Improves Spindles

Much of this development work is being done in the shops where production must go on with minimum unit costs. The author stated that his company has conducted considerable research in this direction and has been able to manufacture, for its own use, spindles that will produce many times the quantity that were produced prior to this experiment. Choice of timing unit is important as with the use of different controls the same transformer may run so hot as to destroy the insulation or may remain cool and produce more welds a day. Whether a control will allow the mechanical stress to become excessive on the welding transformer is governed by the way the current is turned on or off in its cycle of operation.

Mr. Landstrom cited many controls that are on the market for resistance welders and mentioned the various points which the welder must observe if he is to avoid wrong applications or improper care. He also warned against the improper or incorrect use of water and advocated thorough study of this subject. He advocated attention to gun welding as a method for welding in otherwise inaccessible places.

Automatic welding, the author warned, is not the final answer to all welding ills but it is extremely useful. Rims formerly were butt welded, two men to a welder, at the rate of 1300 in nine hours. The first fully automatic welder, operated by one man, produced some 3100 rims in the same time. Since then this speed has been exceeded greatly. Seam welders producing three to four feet a minute now are producing, with modern controls, eight to 10 feet a minute. Spot welders that made 75 to 90 spots a minute now can make 200 or more. These are but a few of the results obtained with automatic equipment.

Striking progress in the fabrication of steel structures and machinery parts by gas cutting and welding was depicted by A. E. Gibson, president, Wellman Engineering Co., Cleveland. He showed slides of salt evaporators, blast furnace skiphoists, gear reducer cases and many other assemblies made by this method. He showed views of cut and welded brackets, saying these parts had been made at about 40 per cent of the cost of competitive methods.

Mr. Gibson pointed out that welding is an expensive process and said that as little welding should be done on any job as is possible. Many economies can be made. For instance, his company recently installed a brake on which it is able to make many joints by bending instead of welding. The result is a lowering in the cost of producing welded structures.

Pipe Bent to Contour

Wrinkle bending, a method of making overland pipe lines conform to the contour of the country over which they pass, was described by R. B. Aitchison, The Linde Air Products Co., New York. To wrinkle bend a pipe an oxy-acetylene torch is used to heat a narrow band at right angles to the pipe and extending half way around the pipe. The wrinkle then is formed by manual or mechanical bending. The formation of the wrinkles is made without reducing the internal diameter of the pipe line. Bends of 180 degrees may be made by this method.

Welding as an aid in the construction of the dam at Fort Peck, Mont., was described and illustrated by T. B. Jefferson, United States engineer department. Many jobs of a so-called "impossible" character, he said, were done by this method. At one time 423 welding operators were employed on this project.

A.S.M.E. Details Meeting Program

■ An extensive program of sessions and technical papers has been arranged for the fifty-eighth annual meeting of the American Society of Mechanical Engineers to be held at the Engineering Societies building, New York, Dec. 6-9. The meeting will begin with the business session on the afternoon of the first day. The annual dinner will be served on Dec. 9 at Hotel Astor.

Among sessions of interest to the metalworking industries are those devoted to motion study, machine shop practice, elasticity, mechanical springs, high temperature joints, fuels, lubrication, management, apprentice training and safety. Details of important sessions follow:

Monday, Dec. 6

MORNING

Section group delegates' conference.
Council meeting.

AFTERNOON

Business meeting.

EVENING

Motion Study

"Labor's Attitude Toward Time and Motion Study." Speakers: G. L. Gardiner and G. S. Dierstein.

Machine Shop Practice

"Profilometer for Rapid Measurement of Surface Roughness," by E. J. Abbott.
"Grinding and Maintenance of Sintered Carbide Tipped Tools," by Malcolm F. Judkins.

Tuesday, Dec. 7

MORNING

Elasticity

"Stress Model of a Complete Airship Structure," by L. H. Donnell, E. L. Shaw and W. C. Potthoff.
"Distortion of the Photoelastic Fringe Pattern in an Optically Unbalanced Polariscope," by R. D. Mindlin.
"Correlation of Creep and Relaxation Properties of Copper," by C. C. Davenport.
"Properties of Photoelastic Materials," by C. W. Armstrong and G. H. Lee.
"Buckling of Elastic Plates of Variable Thickness," by R. G. Olsson and M. E. Reissner.
"Rectangular Plate Problems," by Gerald Pickett.

Mechanical Springs

"Heavy Helical Springs," by C. T. Edgerton.
"Wire Springs," by F. P. Zimmerli.
"Spring Materials," by D. J. McAdam Jr.

AFTERNOON

Management

"Decisions of National Labor Relations Board," by J. W. Madden.

Critical-Pressure Steam Boilers

"Progress Report of an Investigation of Oxidation of Metals by High-Temperature Steam," by A. A. Potter, H. L. Solberg and G. A. Hawkins.
"Protecting Steel from Intercrystalline Cracking in Aqueous Solutions," by W. C. Schroeder, A. A. Berk and R. A. O'Brien.
"Decomposition of Sodium Sulphite So-

lutions at Elevated Temperatures," by F. G. Straub.
"Some Results from Research on Flow Nozzles," by H. S. Bean and S. R. Beitler.

High-Temperature Joints

"Welded Joints," by F. L. Everett and Arthur McCutchan.
"High-Temperature Joints," by Joseph Marin.
"Bolted Joints for High-Pressure Vessels," by E. O. Waters.
"Practical Aspects of Turbine Cylinder Joints," by C. B. Campbell.
"Effect of Temperature Variation on Creep Strength of Steels," by E. L. Robinson.

Wednesday, Dec. 8

MORNING

Management

"Problems in Unionized Plants," by H. D. Bergen and G. W. Taylor.

Strength of Materials

"Fatigue Failure from Stress Cycles of Varying Amplitude," by B. F. Langer.
"Simultaneous Effects of Corrosion and Abrupt Changes in Section on Fatigue Strength of Steel," by T. J. Dolan.
"Fatigue Life of Tapered Roller Bearings," by W. O. Clinedinst.

AFTERNOON

Management

"Scientific Management in the Unionized Plant," a case history.

EVENING

Annual dinner, Hotel Astor.

Thursday, Dec. 9

MORNING

Fuels

"Water-Cooled Underfeed Stokers," by Joseph S. Bennett.
"Energy Distribution in a Pulverized Fuel Furnace," by D. E. Wise and W. J. Wohlenberg.

Lubrication

"Thrust Bearings," by F. C. Linn and R. Sheppard.
"Tests of a 7 x 10½-Inch Bearing at 3600 R.p.m.," by L. M. Tichvinsky.
"Steel-Plant Lubrication," by J. F. Pelly.

Management-Materials Handling

"Importance of Materials Handling as a Conserver of Skilled Labor," by C. K. Pevear.

Safety

"Application of Safety in Mechanical Production," by Everett W. Martin.
"Adequate Job Training for Accident Prevention," by Glenn L. Gardiner.

AFTERNOON

Apprenticeship Training

"Apprentice Training," by W. F. Patterson.

Lubrication

"Surface Finish," by Stewart Way.
"Running-In Characteristics of Some White-metal Journal Bearings," by S. A. McKee and T. R. McKee.
"Static Friction," by W. E. Campbell.

Machine Shop Practice—Safety

"What Constitutes a Safe Dust Level in Foundries," by T. F. Hatch.
"Safety in Machine Design," by A. W. Luce.
"Radiographic Inspection," by H. R. Isenburger.

EVENING

Railroad

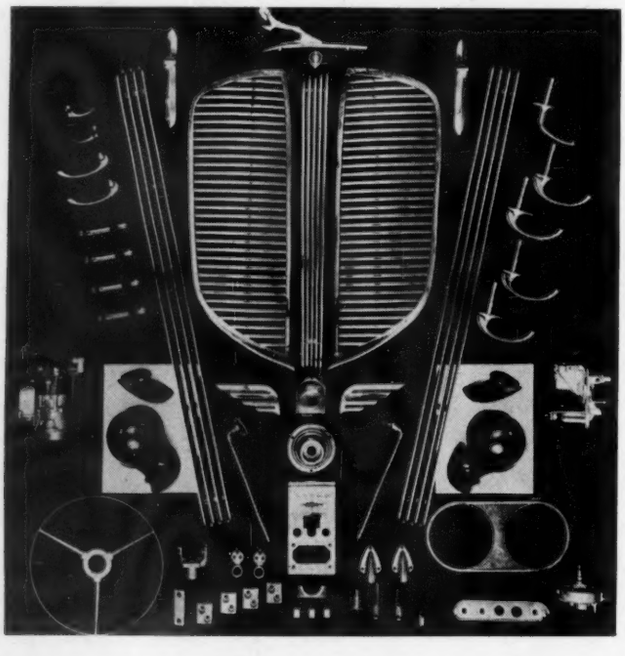
"Design of Railway Axles and Locomotive Crankpins," by R. Eksergian.
"Air Conditioning of Railroad Passenger Cars," by L. W. Wallace and G. G. Early Jr.
"Report of Progress in Railway-Mechanical Engineering by Survey Committee RR6," by A. Giesl-Gieslingen.

Automobile Stylists Use More Die Castings

■ Modern chassis have attained a degree of excellence such that radical changes in their design are rarely required. Minor improvements are made from year to year, but are not of sufficient moment to serve as a basis for a sales campaign.

This year chief emphasis has been laid on restyling, as it is coming to be recognized more than ever that eye-appeal is of major importance as affecting sales. The average buyer takes it more or less for granted that the mechanism of the car, if it bears a generally good reputation, will provide the performance and dependability required. This being the case, he looks for smarter appearance and gets it. It is clear that some such reasoning is back of many of the changes to be found in 1938 models. It is typical of the Chrysler type of design in styling as well as in many other features.

Of late, stylists have been concentrating on "front ends"—as the front portions of cars, including grille, hood, fenders, aprons and headlamps along with bumper and some minor items, are termed. Next in importance come instrument panels, steering wheel and appointments, both interior and exterior. In these items, in any event, are found most of the styling changes on the Dodge for 1938.



These 76 zinc alloy die castings, used on the 1938 Dodge, are typical of the widespread use of die castings in the automotive industry

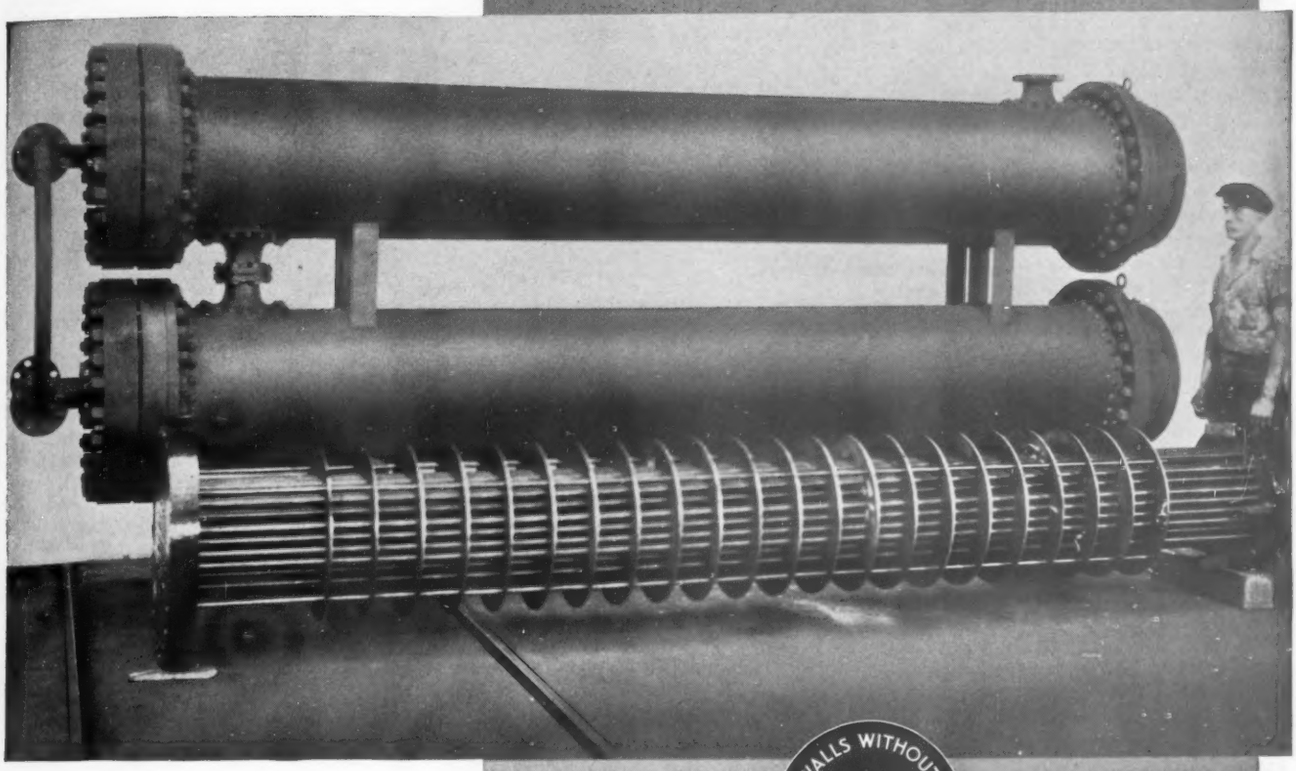
Steel Is Rustproofed

Steel (chiefly in sheet form), zinc die casting alloys, and plastics are the more important materials chosen for conversion into the units mentioned. Fenders, hood panels, radiator shell and apron, the last two forming a one-piece stamping in the Dodge, are fabricated from steel as heretofore. All steel metal parts are given a Bonderite rust resisting treatment, and all are finished in body colors which withstand long service.

When it comes to grilles, on which the stylists have decreed much bright work, however, several problems enter. Small openings between grille bars and the narrow sections required offer very difficult stamping problems unless the grille be fabricated from numerous small pieces, which in turn involves considerable assembly cost. Finishing in nickel and chrome is not inexpensive and rusting is always a possibility under severe exposures. Although a stamped grille has been used on Dodge cars in former years, that on 1937 models met with some sales resistance in comparison with die cast grilles on certain competing cars. This led dealers to demand a die cast grille on the 1938 model, as being more rigid and finer in appearance.

The new grille, shown in an accompanying illustration, possesses unusual eye-appeal besides meeting other requirements. It includes two large die castings with horizontal grille bars, one at each side of a drawn steel strip coming down from the center panel of the hood and carrying the body color. In the center of this strip fits a third die cast section having five vertical bars which match similar bars on a small separate cover plate for the crank opening. The latter is also die cast

Here's how to Cut
HEAT EXCHANGER MAINTENANCE



WALLS WITHOUT WELDS

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IT'S not the cost of new tubes that makes the plant engineer shake his head. It's the cost and the delay of opening up the exchanger, inserting the new tubes, and then reassembling and reconnecting the exchanger — these are jobs that eat heavily into any plant maintenance appropriation.

Wise power-plant engineers have found a method of keeping down maintenance costs on heat exchangers —by standardizing on the finest seamless tubes that modern metallurgy has produced to date—NATIONAL Seamless Heat Exchanger Tubes.

Ask any power-plant engineer who has used them and he'll tell you they can't be beaten for real economy . . . that they save money by eliminating frequent replacements and cutting out idle time.

NATIONAL Tubes offer you these savings because they are seamless — pierced from a solid billet of finest quality steel—uniform wall-strength throughout. They have no welds — no line of possible weakness. Each tube receives a final heat treatment, which makes it easy to bend, flange, coil, or expand into headers.

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UNITED STATES STEEL

(as are the two wing-shaped ornaments mounted on the apron at each side of it) and it carries the ram design in a gold and black medallion of characteristic Dodge appearance.

Above this central casting is the formal Dodge insignia, and on the nose of the hood panel a die cast radiator ornament. All of these castings are of the usual high-purity zinc alloy, of course, and all are heavily plated to Chrysler specifications which require a minimum combined coating of copper and nickel of 0.0008-inch thickness and 0.00001-inch of chromium. This practice is standard for all the other plated die castings on the exterior of the car. On each of the side-hood panels are long four-bar louvre die castings which have the same bright finish on their outer face. These castings, in common with the three forming the grille, have the sides of the openings in black enamel which serves to set off the chrome plated face and tends to prevent seeing through the grille and louvres.

The instrument panel of the new Dodge has been produced in a simple but effective manner. The temperature, oil, gasoline and ammeter gauges are all within a dual circular layout with the speedometer, the entire unit being encased in a single zinc alloy die cast frame. This die casting has been handsomely finished in a combination chromium and wood grain effect to harmonize with the glove compartment door on the right hand side of the panel. Another feature which makes for simplicity is the decorative insignia plate in the center of the panel design. This part, also a plated die casting, comes equipped with an ash tray in its lower portion, but the entire section can be replaced by a grille and radio control unit when a radio is installed, the grille also being die cast of zinc alloy. Below this center plate is a die cast recessed panel on which four control knobs are located.

Besides the panel there is offered as optional equipment a steering wheel with a die cast hub, stainless spring steel spokes, plastic rim, and a die cast and plated horn ring.

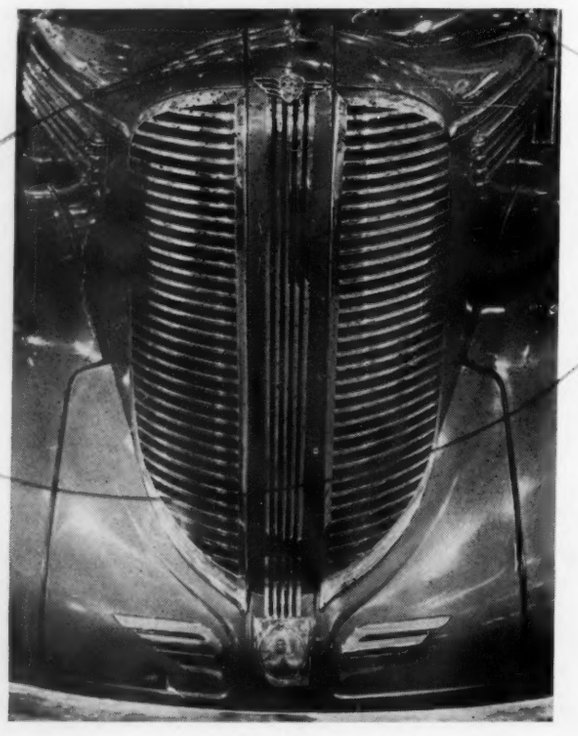
Other interior die castings, include all window regulator cranks and door handles, a steering-post bracket, brackets for robe cord and assist cords as well as for sun visors, an ignition switch, four door striker plates, glove compartment lock and handle, two ventilating wing latches and an ignition lock.

Besides all these exposed die castings for interior and exterior, finished with chromium plate or enameled, there are used on the car the following die castings: carburetor, fuel pump, windshield wiper motor, speedometer frame and two horns, with some other minor parts. These make a total of 76 die cast units for a four-door sedan. Their total weight is 63 lbs., of which about half is in the front end elements. This is indicative of the importance played by die castings in a modern car, as it represents perhaps a six-fold increase within a ten-year period.

Bulletin Describes Alloy

■ Technical information may be obtained on the "Engineering Properties of 'K' Monel" in bulletin T-9, issued by the Development and Research division of International Nickel Co., 67 Wall street, New York.

"K" Monel is a corrosion resistant nonferrous alloy of nickel, copper and aluminum. As a result of 14 years experience in mill and laboratory study, it is found to have increased properties of strength and hardness. Illustrations, tables, graphs and discussions involving the composition, physical contents, millworking, heat treatment, shop working, machining and casting of the alloy are embodied in the bulletin.



Front end view of 1938 Dodge showing grille die cast in three parts, radiator ornament, hood louvre and other decorative die castings

Issues Roller Bearing Engineering Journal

■ Ratings, bearing selections, methods used in calculating bearing loads for a wide range of applications and complete detailed information as to bearing sizes and load carrying capacity are embodied in the fifth edition of the engineering journal recently issued by Timken Roller Bearing Co., Canton, O.

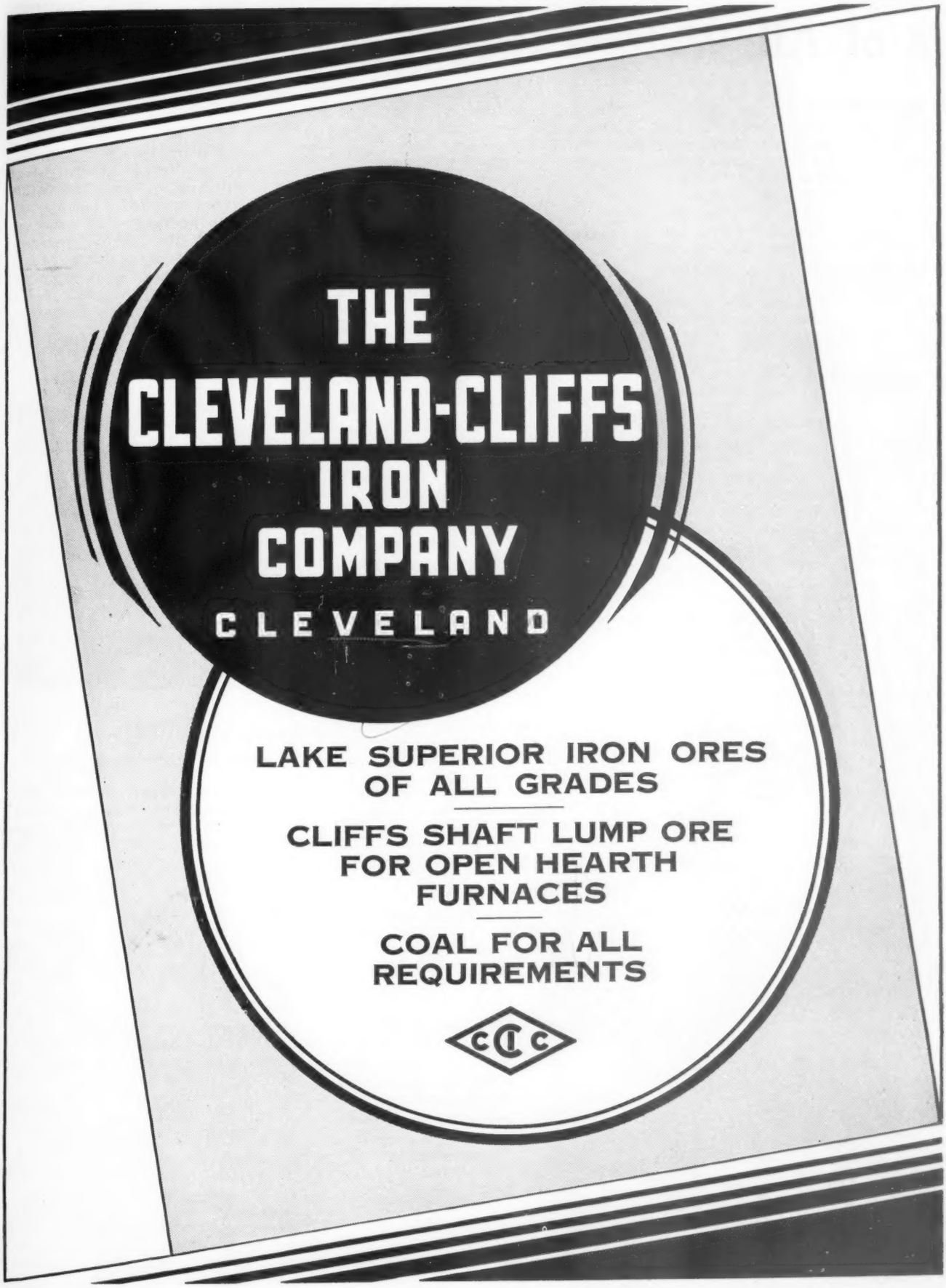
The journal, composed of 294 pages filled with detailed information, along with tables and full and half-sized drawings of bearings, is furnished in a standard 8½ x 11 inch, three ring binder with stiff covers. Data on standard shims for both cup and cone adjusted bearings, locknuts and washers, annular groove closures and standard tubes is included along with a special section on cup and cone fitting practice and specifications for lubricants to use under a wide range of conditions, speed and temperatures.

It is claimed the information presented in the general section of the journal is based on knowledge and experience gained during the past 40 years as well as data secured through elaborate research and test laboratories which the company maintains.

A supplement to the journal covering the application of tapered roller bearings to oil field equipment that will be interesting to users and manufacturers of such machinery was also recently issued. Illustrations of bearing mountings, data on bearing selection, fitting practices, closeures and assembly are included.

Develops Fillet Gage

■ Una Welding Inc., Cleveland, has designed and is furnishing free of charge to its customers, a fillet gage for use in checking the accuracy of fillet welds. The gage may be used with ¼, ⅜, ⅝ and ½-inch fillets.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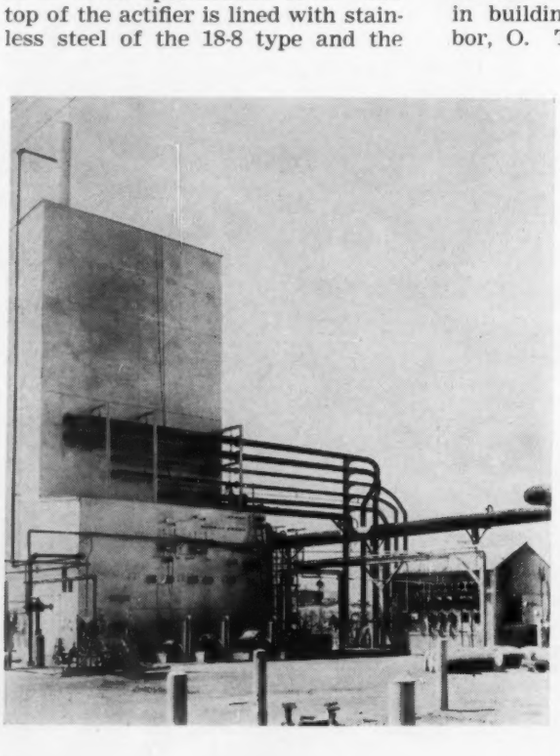
Gas Purification Plant Is of All Welded Steel

■ SECOND plant for low cost purification of refinery gas by the new Koppers phenolate process is being erected for the Atlantic Refining Co., Philadelphia, by the Engineering and Construction division, Koppers Co., Pittsburgh. The first was erected at El Segundo, near Los Angeles, for Standard Oil Co. of California and placed in operation in August, 1936.

By this process the gas is prepared for treatment in a polymerization unit for production of liquid hydrocarbons, purification being to the extent of 95 to 99.8 per cent. The Atlantic Refining Co. plant will have capacity for recovery of hydrogen sulphide from 22,000,000 cubic feet a day of refinery still gases at 225 pounds pressure. The hydrogen sulphide may be converted to sulphuric acid and the purified still gas further processed by polymerization. Simplicity and low cost of this system result from the use of a phenolate solution which has an extremely high capacity, 2000 to 4000 grains per gallon, for carrying hydrogen sulphide. As a result it is necessary to circulate only five to 10 gallons of solutions per 1000 cubic feet of sour gas.

These plants are built entirely of steel. They are of welded construction throughout, stress relieving being applied where pressures are high. The principal steel used is A. S. T. M. specification A-70. The top of the actifier is lined with stainless steel of the 18-8 type and the hydrogen sulphide lines and dephlegmator are made entirely of such stainless steel.

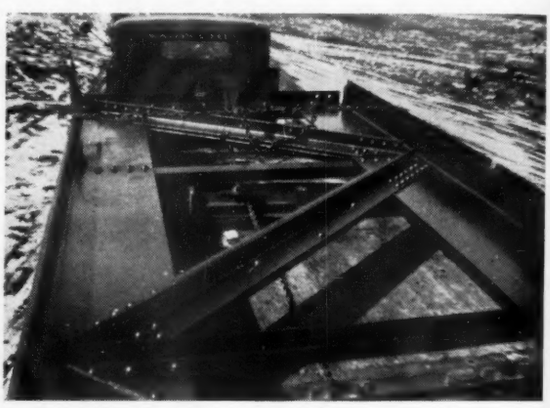


NEW gas purification plant is built of steel, with all welded construction throughout. Stainless steel is employed where resistance to corrosion is required

Riveted Trusses Use T-Sections For Chords

■ KLEIN STEEL CO., Bellevue, O., has developed a method of constructing riveted trusses and latticed girders with T-sections for chords instead of angles and gusset plates. The accompanying illustration is a close-up view of one end of a latticed girder recently fabricated for the Steinle-Wolfe Construction Co., Fremont, O., for use in building a school at Oak Harbor, O. The chords were made of flange beams 36 inches wide split through the center of the web to form 18-inch T-sections. The stem of the resulting T provided ample space for the riveted connections of diagonal members. The use of quadruple diagonals in place of extremely heavy double angles results in a member of neat, symmetrical appearance.

The company has used smaller split-beam sections in welded truss construction for years but this is the first instance in which it has applied the idea to heavy riveted construction. In this instance the decision as to riveting or welding rested with the architect. The company states that this type girder could be welded with very apparent economies. That is, it can be welded or riveted without any appreciable change in design.



CLOSE up of one end of latticed girder with chords made of flange beams 36 inches wide split through the center of the web to form 18 - inch T - sections

Light Weight Diesel Starts Instantaneously

■ An instantaneous-starting, lightweight, 6-cylinder diesel engine which can accelerate to 50 miles per hour in 14 seconds through the gears has been introduced by F. Perkins Ltd., Peterborough, England.

The engine, known as the Panther, is designed to be used in private cars. Lighter than most 6-cylinder motors, with low cost of operation and improved acceleration, it is claimed that the engine is the most modern available. According to figures of the company, this engine still retains its economic advantage by being able to offer work at half the fuel consumption for a given amount of work when compared with gasoline motors.

Some of the outstanding features of the new engine include starting without the use of heater plugs, elimination of the "diesel knock" which is attributed generally to such engines and caused by delayed combustion, and a continuous crankcase ventilation system through which filtered air from the air cleaner is drawn through the engine.

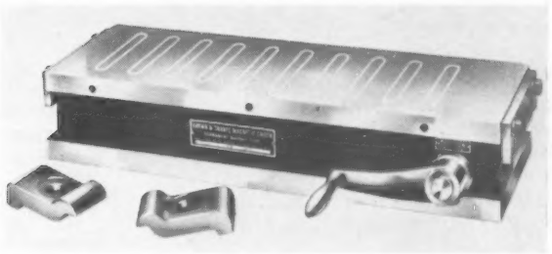
NEW EQUIPMENT

New Magnetic Chuck Is Nonelectric Unit

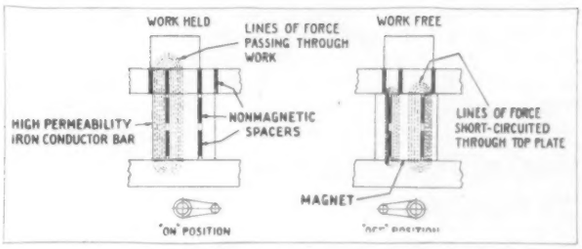
■ Brown & Sharpe Mfg. Co., Providence, R. I., recently introduced a magnetic chuck embodying permanent magnets and eliminating entirely wiring, heating in operation and current costs.

Magnetic flux is controlled by a simple movement of the crank which changes the position of the magnets relative to the top plate so work is either held or released. Work placed on the working surface is held securely when crank is at On position, and is released by 180 degree movement of crank to Off position. Magnets are of special alloy and said to contain several times more energy than previously obtainable permanent magnets.

Working surface of the chuck and its base are ground parallel and at right angles to the back. Both ends and back are provided with removable stop plates that may be adjusted vertically to suit the requirements of different jobs. Moving parts are equipped with greaseless bearings. The chucks are portable and are adapted for either wet or dry grinding, being completely sealed so coolant cannot enter. They are furnished in two sizes with working surfaces of 5⅝ x 10⅜ inches and 6⅜ x 18⅛ inches. Both models are 3⅜ inches high.



Brown & Sharpe non-electric, magnetic chuck is shown with diagram of operating mechanism

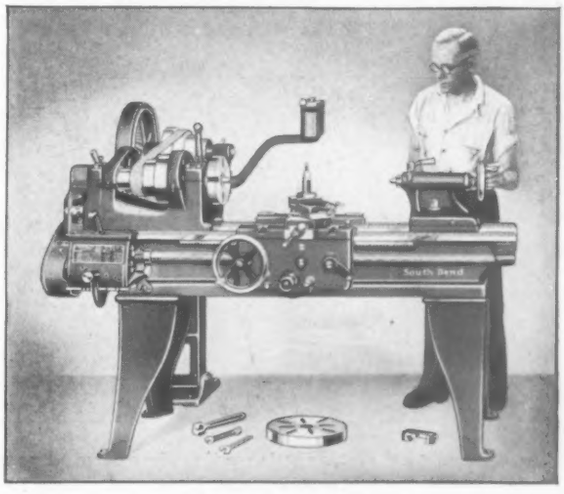


Lathe Drive Adjustable

■ South Bend Lathe Works, South Bend, Ind., has announced a new design of back-geared, screw cutting, precision lathes in the pedestal adjustable motor drive and available in 9, 11, 13, 15 and 16-inch swing and 3 to 12-foot bed lengths. Pedestal adjustable motor drive mechanism is a separate unit with the motor and countershaft mounted on a pedestal back of the lathe in a position horizontal with the headstock cone pulley of the lathe.

Power is transmitted from the motor to the countershaft by V-belts, and from the countershaft to the lathe spindle by flat leather belts. Reversing switch near lathe spindle permits easy starting, stopping or reversing. Features of the new drive include vibration elimination, silent belt drive providing smooth easy pull, no overhead belts, V-belts from motor to pulley enclosed by guard, screw-type belt tension adjustment for any desired pulling power, and release for shifting belt to change spindle speeds.

Other new features and improvements on the machines include heat-treated headstock spindle with all bearing surfaces hardened and ground, including the taper hole; special alloy steel spindles with phosphor bronze bearings, line bored and lapped to a perfect bearing and adjustable for wear; new double-wall apron with self-oiling steel gears, and all gear shafts sup-



South Bend back-geared, screw-cutting lathes have pedestal adjustable motor drive

ported on both ends; a multiple-disk, friction clutch in apron. A number of attachments are available to equip the lathes for milling, key way cutting, grinding, turning tapers, draw-in collet chuck work, gear cutting, and other operations.

Claim Alloy Steels Cut Easily as Boiler Plate

■ W. J. Savage Co., Knoxville, Tenn., has announced redesign of its entire line of Savage nibbling machines to the extent of fewer working parts, increased power, safety and easier operation. There are no moving parts in the streamlined operating heads except the metal cutting tools. Cutting is accomplished by template or to a scribed line and it is claimed alloy steels may be cut as easily as boiler plate, while power is sufficient to punch starting holes to one-half rated capacities. Features of the new units include direct-over-center drive, totally-enclosed one-piece revolving head, combination collet and ram lock and redesigned main frame.

Nibblers are rated to cut from ⅛ to ½-inch thick sheet metal and have a range of throat depths from 8 to 36 inches for handling sheets in any length and from 16 to 72 inches wide.

Controllers Sensitive To Slightest Change

■ Industrial Instrument Co., 96 E. Miller avenue, Akron, O., is the manufacturer of the No. 19 Summit automatic, air-operated pressure controller, designed to maintain constant pressure on the equipment to which it is connected, and sensitive to less than ¼-pound pressure change.

Unit can be mounted either on the diaphragm top of the valve or on a panel located near the valve. Case is sand cast of special aluminum, made in two parts. Cover is arranged with an adjusting knurled knob and pointer to indicate the setting with the universal joint between the adjusting screw. Base casting is drilled for air passage to all connections, with no pipe or tubing inside the case. An air leak adjustment is located outside the case.

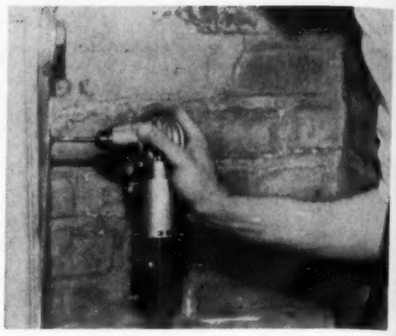
Prime element of the controller is constructed from bronze castings, and screws into the base casting of the controller. It has a large hex head for removing it when cleaning is necessary. Air valve stem is made of stainless steel and is in one piece, with spring mounted on top to keep it on seat with aid of the air pressure. For pressure reducing or controlling requirements the unit will handle any size valve, direct or reverse-acting and balanced types. It is claimed the controller will hold a dead-end pressure without building up on the expanded side of the diaphragm valve.

Summit model No. 19 automatic, air-operated pressure controller is sensitive to less than ¼-pound pressure changes

New Drill Is "Shorty"

■ Black & Decker Mfg. Co., Towson, Md., has announced a new unit known as the Shorty ball-bearing, electric drill. Chuck spindle is mounted at right angles to the motor and reduces overall working length of the tool to 4½ inches.

Motor dimensions have also been reduced to a minimum so tool fits snugly in operator's hand and requires no extra handle. Deep vents cast in the gear head provide for free passage of air, even though tool is grasped by the head. Tapered end of gear head extends over the chuck, protecting operator's fingers. Unit is ball-bearing equipped throughout and has a universal motor operating on alternating or direct-current. Thumb control switch

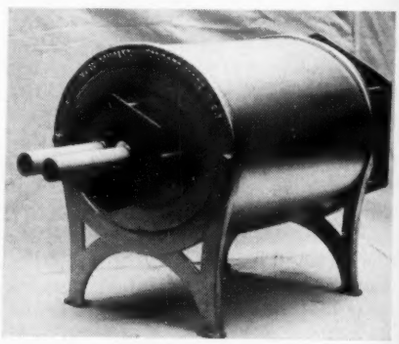


Overall working length of the Shorty drill is 4½ inches

is in the line just back of tool. Drill is available in 3/16 and ¼-inch sizes.

Sentry Redesigns Furnace

■ Sentry Co., Foxboro, Mass., has announced redesign of its model V, high temperature tube combustion furnace with increased insulation and other improvements. New tube sizes have been added and also a dual tube furnace, supplied in several tube sizes. Air-cooled terminals, requiring no replacement or periodic attention are used. Especially for stainless steels, high operating



Redesigned line of Sentry high temperature tube combustion furnaces now includes this dual tube unit

temperature offered by the furnaces is claimed to result in quicker and more accurate analyses. Efficiency is said to have been increased and power consumption lowered. Tubes are gas tight and points where tube passes through end walls are fitted to prevent unnecessary heat loss. Back end of tube is twice reduced in diameter, the first restriction being made as it leaves the heating chamber. Second restriction is made to a size convenient for a rubber tube connection. Restrictions reduce heat losses around the tube and assure that end will remain properly cooled without using a longer tube.

Heavy Bar Stock Stored In Special Floor Racks

(*Concluded from Page* 50)

other pair of beams. A bar of steel then can be rolled out past the end of the rack so that it can be handled by the crane. Stops on the ends of the extensions prevents the bar rolling off. To place stock, the bar is set on the extension by the crane, rolled into place and the stops replaced to hold it from rolling.

The racks are not fastened to the floor but may be moved, empty, by the crane if for any reason it should become necessary to change their location. Short lengths of bars are stored on the floor. The rack, however, is used for large bars from 9 feet, minimum, to 20 feet in length.

Light rods, pipe and bars which do not require crane handling are stored and handled from the end of the rack shown in the background. These racks are constructed of vertical 5-inch channels tied across with 1-inch bolts enclosed in pipe spacers to form the "shelves." The bolts also extend through vertical bars placed about 1 foot apart which act as dividers and supports for the horizontal bolts or shelves. These divide the rack into compartments about 1 foot square. The vertical channels or frame are tied together by diagonal angle irons and a channel running lengthwise at top and bottom to provide a rigid construction and prevent collapse.

Ends Discrimination Against Older Employees

■ At a meeting held in Buffalo recently, a group of local manufacturers agreed to aid a campaign to end discrimination against workers over 40 years old.

There was some interesting discussion of various problems, one speaker stressing the need for rehabilitating men with curable organic ailments, such as hernia. The pledge to end discrimination is in line with similar action being taken in a statewide campaign. In several instances in the past few years, jobs of older workmen have been safeguarded by installation of materials handling equipment. Physical deficiencies formerly made it impossible for these older employes to continue to do their allotted tasks. Their employers, desirous of keeping them on the payroll because of their long and loyal service, installed mechanical equipment to do the heavy lifting tasks.

Oddly enough, there have been sizable sales of equipment for this purpose. Two such instances were checked recently by a staff representative of STEEL and in each case the desire to retain old skilled employes was the determining factor in the purchase of the handling equipment.

Chromium-Iron Alloys Treated in Monograph

■ *Alloys of Iron and Chromium, Vol. I, Low-Chromium,* by A. B. Kinzel and Walter Crafts; cloth, 535 pages, 6 x 9 inches; published for the Engineering Foundation by McGraw-Hill Book Co. Inc., New York; supplied by STEEL, Cleveland, for $6; in Europe by Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, London.

This volume is one in the series of monographs being prepared by the iron alloys committee of the Engineering Foundation, and as its title indicates, is devoted to the low-chromium alloys of iron and chromium. A second volume in preparation will cover the high-chromium alloys. This volume is a review and summary of published information and available unpublished data on iron-chromium alloys, iron-chromium-carbon alloys and the properties of steels and cast irons containing less than 10 per cent chromium.

The subject matter is divided into 13 chapters of which the first gives the history of chromium steels, preparation and properties of chromium metal, and properties and manufacture of ferrochromium. Chapter II discusses the constitution of iron-chromium alloys while Chapter III describes the iron-chromium-carbon system. Transformations in chromium steels, general effects of chromium in iron and steel, and manufacture and heat treatment of plain low-chromium engineering steels are the subjects of Chapters IV, V, and VI.

Chapter VII is devoted to properties of plain low-chromium engineering steels, and Chapter VIII relates to low-chromium engineering steels containing manganese, silicon, nickel or copper. Chapter IX describes low-chromium engineering steels containing molybdenum, vanadium or tungsten while Chapter X covers chromium tool steels containing less than 3.5 per cent chromium. Special purpose low-chromium steels containing up to 3.5 per cent chromium, low-chromium cast iron, and chromium engineering steels containing 4 to 10 per cent chromium are subjects of the remaining three chapters.

Cadmium Plated Chains

■ Lasyon, a new tire chain fabricated of welded side chains and hardened cross chains which are rust proof cadmium plated, is announced by Woodworth Specialties Co., Binghamton, N. Y. This chain, it is claimed, will fit on all 1937 model cars including the newer models being introduced. A pair of rubber adjusters is furnished with each pair of chains.

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Steel Clad
Locked Coil
Regular Lay
Lang's Lay
Hemp Center
Wire Rope Center
Metallic Core
Seale - Filler Wire
Warrington

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Screws—Bristol Co., Waterbury, Conn., has published a four-page folder describing its line of Multiple Spline screws and socket head cap screws.

Controller—Wheelco Instruments Co., 1929 South Halsted street, Chicago, is distributing bulletin 650 describing the new Wheelco proportioning indicating controller.

Presses—Lukenweld Inc. division, Lukens Steel Co., Coatesville, Pa., has issued an illustrated bulletin on its hydraulic presses with non-deflecting, continuous welded frames.

Melting Pots—Harold E. Trent Co., 618 North 54th street, Philadelphia, has published a bulletin on Trent electric melting pots and other electrically-heated industrial equipment.

Capacitors—General Electric Co., Schenectady, N. Y., has compiled a pictorial booklet dealing with the manufacture of Pyranol capacitors and containing samples of the thin papers and foils used in them.

Grinding Attachment—Cincinnati Milling Machine Co., Cincinnati, has issued bulletin M-768 on its new Radius grinding attachment for the Cincinnati No. 2 cutter and tool grinder.

Air Filters—Independent Air Filter Co., 228 North La Salle street, Chicago, has issued bulletin D-108 on its model L, double-duty, automatic, self-cleaning, non-clogging air filters.

Heating—Trane Co., La Crosse, Wis., has issued bulletin V260 on Trane heating specialties and which includes data on vapor heating systems, split systems, vacuum systems and on heat loss calculations.

Hoists, Dump Bodies—Gar Wood Industries Inc., Detroit, is distributing two new bulletins, No. 2 illustrating and describing Gar Wood heavy-duty cam and roller hoists and No. 3 dealing with heavy-duty dump bodies.

Pumps — Worthington Pump & Machinery Co., Harrison, N. J., has issued bulletin W-122-B1 describing three types of vertical, duplex, steam pumps for marine service. Also issued is new literature illustrating and describing pressed steel frame mounted, ball-bearing, centrifugal pumps, type CF.

Safety Apparel—Industrial Gloves Co., 700 Garfield boulevard, Danville, Ill., has compiled a large loose-leaf catalog covering its line of Steel-Grip safety apparel and including many new clothing safeguards for industrial use.

Pyrometer — Pyrometer Instrument Co., 103 Lafayette street, New York, has issued catalog 90 on the new Pyro Bi-Optical pyrometer for simultaneous measurement of blackbody and actual, or color, temperature.

Hose, Couplings—Packless Metal Products Co., Long Island City, N. Y., has issued a file-size booklet on Packless seamless flexible metal hose, detachable self-sealing couplings, self-flaring tube couplings and copper tubing.

Tubing—Timken Roller Bearing Co., Canton, O., has assembled a pocket-size handbook for those specifying and using seamless mechanical tubing and listing tolerances and mechanical properties, weight, and other information.

Drainage Pipe—Armco Culvert Manufacturers' association, Middletown, O., has issued a pamphlet tracing the history of corrugated metal drainage pipe from 1896 to the present. Charts, tables and photographs are included.

Building Electric Motors By Modern Methods

(*Concluded from Page* 44)

operated independent crane for lifting motors onto skids. The conveyor from the box shop which feeds crates to the packing floor enters between the motor conveyors, thereby feeding both lines.

When a motor is crated, it passes to the warehouse over a conveyor line which has installed in it a dial scale for automatically recording the weight. At the same time, a workman marks the crate. In the warehouse, the motor must either be stored or shipped.

The warehouse aisle is equipped with two overhead cranes, each of different span and on runways of different elevations. The cranes overlap in the center of the building, but neither can travel full length of the warehouse. A conveyor system paralleling the west wall and provided with equally-spaced lateral spurs solved this problem. Motors coming from the packing floor are routed down the conveyor and deflected to the proper lateral for stocking. The overhead crane picks up the motors and places them in adjacent piles for stock. In no case does the crane travel exceed two bays of 40 feet.

Motors to be shipped are delivered to the shipping floor, which is 52 inches higher than the warehouse floor, through a tunnel equipped with an inclined power-driven conveyor, Figs. 13 and 15. Located at the midpoint of the warehouse, the tunnel conveyor is tied in with the warehouse conveyor, thus motors from the packing floor can be routed directly to the shipping floor via the tunnel without the necessity of handling by cranes or trucks. Motors from stock can be placed on the conveyor and handled similarly. The shipping floor is served by floor operated overhead cranes.

Ship on Schedule

Shipments are made by railroad car or motor truck. For carload shipments, a load of motors usually is accumulated; motor truck shipments are by daily schedule, regardless of load. Motors for car loading are loaded directly into the cars by a gravity conveyor running from the tunnel along the building wall and provided with laterals, or they are loaded by hand truck from the accumulation piles. Motor trucks back into the building and load directly from the loading platform.

The new motor aisle provides a straight-line flow of materials from raw stock to finished motors and shipping; the old layout consisted of functional process groups, widely separated. Therefore, the new setup has greatly reduced the total number of operations which must be performed and the distance of travel. Reference to the process flow chart for parts for a typical motor reveals that total operations have been reduced from 67 to 41, and distance of travel has been cut from 17,760 feet to 3420 feet.

A breakdown of total moves, old method compared with new method, is as follows: 18 moves over 6280 feet by electric truck have been totally eliminated; by crane, 6 moves over 380 feet have been reduced to 4 moves over 220 feet; by industrial railway, 5 moves over 8960 feet have been eliminated; by conveyor or chute, 30 moves over 1630 feet have been reduced to 32 moves over 2755 feet; and by hand truck, 6 moves over 310 feet have been reduced to 7 moves over 440 feet.

Signs Indicate Recession Near Bottom

Rail, Car Buying Appears; Consumers Using Up Stocks

INDICATIONS are appearing in the steel market to support a belief that the bottom practically has been reached and further recession in buying and production will be small. Last week an accumulation of orders by Pittsburgh mills caused an increase in activity and Chicago mills will operate at a higher rate this week for the same reason.

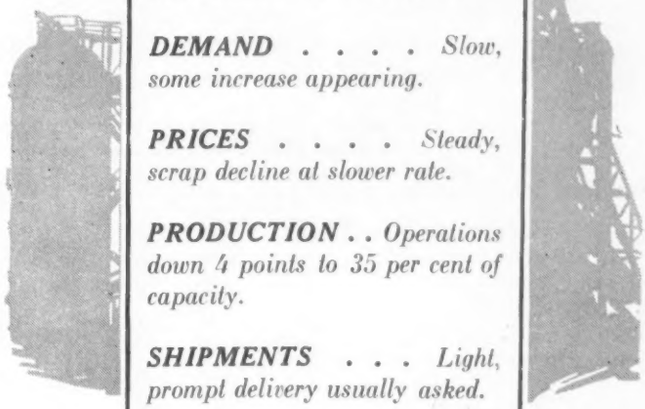
Canvass by steel producers has revealed that in many instances consumers are operating at rates close to those of last spring, using stocks accumulated through midyear, and refraining from further buying until the general situation has cleared. It is apparent that consumers have more steel in stock than had been realized and this is responsible in part for the present dearth of buying.

Most steel producers find buying this month is at a lower rate than in October but in most cases consumers require prompt delivery, indicating immediate need. Continued absence of automobile builders from the market is an important factor in present dullness.

Some additional business from oil companies is in prospect, two pipe lines of moderate length being considered and inquiry for a tanker requiring 4000 tons is expected out soon.

Steelworks operations on a national scale are down 4 points to 35 per cent of capacity. Pittsburgh advanced 4 points to 36 per cent and Cincinnati 10 points to 25 per cent. Birmingham at 54 per cent and New England at 30 showed no change. Chicago was down 7.5 points to 27.5 per cent, Eastern Pennsylvania down 3 points to 35, Youngstown 1 point to 42, Wheeling 11 points to 43, Cleveland 20 points to 15, Buffalo 4.5 points to 28, St. Louis 18 points to 15 and Detroit 11 points to 71.

In spite of their unfavorable financial situation railroads are entering the market with what promises to be a fair rate of buying of rails and rolling stock. The Southern Pacific has distributed 35,332 tons of rails among three makers, Louisville & Nashville has bought 21,000 tons and rail inquiries are expected shortly for about 75,000 tons from two western and an eastern line. Some locomotive inquiry is also before builders. A western road has decided to abandon its plan to buy or build 5000 freight cars. Early favorable action on the request for a 15 per cent increase in freight rates undoubtedly would bring considerable buying at once.



MARKET IN TABLOID

DEMAND . . . . *Slow, some increase appearing.*

PRICES . . . . *Steady, scrap decline at slower rate.*

PRODUCTION . . *Operations down 4 points to 35 per cent of capacity.*

SHIPMENTS . . . *Light, prompt delivery usually asked.*

Tin plate producers are expected to announce contract prices for 1938 in a short time. Demand for this material is holding up fairly well, in spite of the usual seasonal lag, miscellaneous package containers making up to some degree for smaller demand for vegetable packages.

Automobile production last week was 85,757 units, practically the same as the preceding week, when 85,325 cars were manufactured. General Motors produced 40,900, compared with 45,110; Chrysler 26,700, compared with 22,100 and Ford 3525, compared with 2650. The total for all others was 14,632, compared with 15,465 the preceding week. Ford has reached an assembly speed of 1500 daily, the highest attained on his 1938 models.

Closing of contracts for close to 500,000 tons of steelmaking scrap for export to the European scrap cartel's member countries covers scrap to be shipped largely during first half 1938 as the cartel now has about 200,000 tons on contract for shipment this year. At the announced price of $16 to $16.50, North Atlantic ports, and $1 to $1.50 less for South Atlantic and Gulf ports, for No. 1 steel it represents a drop of $5 per ton from the previous purchase by the cartel. It is understood most of the tonnage will be No. 2 steel, at $1 a ton lower than No. 1.

With scrap at present about $9 per ton lower than the high point of the year and about $11 below current prices of pig iron many dealers believe it a good speculation to hold tonnage for a better price when steel production is resumed on a better scale.

In continued absence of buying of scrap STEEL'S composite last week declined 33 cents, to $13.08, which is $9 per ton below the composite price at the beginning of April. The iron and steel composite was lowered 3 cents, to $38.90 by scrap weakness. Finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Nov. 20	Nov. 13	Nov. 6	One Month Ago Oct., 1937	Three Months Ago Aug., 1937	One Year Ago Nov., 1936	Five Years Ago Nov., 1932
Iron and Steel	$38.90	$38.93	$39.17	$39.59	$40.34	$34.65	$28.79
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.90	47.20
Steelworks Scrap..	13.08	13.41	14.04	15.93	20.41	16.05	6.87

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Nov. 20, 1937	Oct. 1937	Aug. 1937	Nov. 1936
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.05c
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, Philadelphia	2.74	2.74	2.74	2.36
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.95
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.60
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.05
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.70
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.50
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.05

Semifinished Material

Sheet, bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$32.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	32.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	32.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	40.00

Pig Iron

	Nov. 20, 1937	Oct. 1937	Aug. 1937	Nov. 1936
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$20.8132
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East. Pa.	25.26	25.26	25.26	21.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.3132
No. 2 fdy., Chicago	24.00	24.00	24.00	19.75
Southern No. 2, Birmingham	20.38	20.38	20.38	15.75
Southern No. 2, del. Cincinnati	23.89	23.69	23.69	19.69
No. 2 X eastern, del. Phila.	26.135	26.135	26.135	22.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.75
Lake Sup., charcoal, del. Chicago	30.24	30.04	30.04	25.87
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.6741
Ferromanganese, del. Pittsburgh	107.49	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	$13.75	$17.15	$21.85	$17.40
Heavy melt. steel, No. 2, E. Pa.	12.25	14.01	18.00	13.75
Heavy melting steel, Chicago	12.25	13.95	19.75	16.50
Rails for rolling, Chicago	14.75	17.25	21.75	17.25
Railroad steel specialties, Chicago	16.25	19.35	22.25	18.25

Coke

Connellsville, furnace, ovens	$4.37	$4.40	$4.50	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53½c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.64c
Granite City, Ill.	2.61c
Pacific ports, f.o.b. dock	2.96c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28½c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.39c
Granite City, Ill.	3.36c
Pacific ports, f.o.b. dock	3.81c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93½c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.04c
Granite City, Ill.	4.01c
Pacific ports, f.o.b. dock	4.41c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.54c
Granite City, Ill.	3.51c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.34c
Granite City, Ill.	3.31c
Pacific ports, f.o.b. dock	3.71c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del.	3.85c
New York, del.	3.89c
St. Louis	3.79c
Granite City, Ill.	3.76c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.14c
St. Louis, No. 20	3.74c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, delivered	2.53c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, del.	2.53c

Bars

Soft Steel
(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.01c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c
Pittsburgh, forg. qual.	2.80c

Rail Steel
To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.60c
Gulf ports	2.91c
Pacific coast ports, f.o.b. car docks	2.96c
Philadelphia, del.	2.85c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young	2.45c
Gulf ports	2.81c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100	0.15 to 0.25 Mo.		0.55
4600	0.20 to 0.30 Mo. 1.50-2.00 Ni.		1.10
5100	0.80-1.10 Cr.		0.45
5100	Cr. spring		0.15
6100	bars		1.20
6100	spring		0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200	spring flats		0.15
9200	spring rounds, squares		0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)

(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1¼ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 1-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
⅜	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½	
2, lap weld	56	
2½ to 3, lap weld	59	
3½ to 6, lap weld	61	
7 and 8, lap weld	60	
10-inch, lap weld	59½	
12-inch, lap weld	58½	

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2⅝" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	.....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅜-inch incl.	47.00
Do., over ⅜ to 47/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.25- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.85-11.30
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens.	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$29.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethlehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	24.30	.....
Cincinnait from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J, from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.95-3.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper, Electro, del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Nov. 13	11.00	12.12½	10.50	45.25	45.25	5.00	4.85	5.75	20.00	16.00	35.00
Nov. 15	11.00	12.12½	10.50	45.37½	45.37½	5.00	4.85	5.75	20.00	16.00	35.00
Nov. 16	11.00	12.12½	10.50	43.00	43.00	5.00	4.85	5.75	20.00	16.00	35.00
Nov. 17	11.00	12.12½	10.50	42.85	42.85	5.00	4.85	5.75	20.00	16.00	35.00
Nov. 18	11.00	12.12½	10.50	41.37½	41.37½	5.00	4.85	5.75	20.00	16.00	35.00
Nov. 19	11.00	12.12½	10.50	41.50	41.50	5.00	4.85	5.75	20.00	16.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	18.12½
Copper, hot rolled	20.12½
Lead, cut to jobbers	8.50
*Zinc, 100-lb. base	10.50

Tubes

High, yellow brass	20.87½
Seamless copper	20.87½

Rods

High yellow brass	14.62½
Copper, hot rolled	16.62½

Anodes

Copper, untrimmed	17.37½

Wire

Yellow brass (high)	18.37½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.50-5.75
*Cleveland	6.12½-6.37½
*Chicago	6.00-6.25
*St. Louis	5.87½-6.12½

Heavy Copper and Wire

*New York, No. 1	7.50-7.75
*Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.50-7.75
*St. Louis	7.25-7.50

Composition Brass Borings

*New York	5.00-5.25

Light Copper

*New York	5.50-5.75
*Cleveland	5.25-5.50
*Chicago	5.50-5.75
*St. Louis	5.00-5.25

Light Brass

*Cleveland	2.37½-2.87½
*Chicago	3.75-4.00
*St. Louis	3.12½-3.62½

Lead

New York	4.00-4.25
Cleveland	3.25
*Chicago	3.75-4.00
St. Louis	3.25-3.50

Zinc

New York	2.75-3.00
Cleveland	2.50-2.75
St. Louis	2.50-2.75

Aluminum

Borings, Cleveland	7.00
Mixed cast, Cleve.	10.00
Clips, soft, Cleve.	12.00
Mixed cast, St. L.	10.00-10.50

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	11.25
Stand. No. 12 alum.	18.00-18.50

WAREHOUSE IRON AND STEEL PRICES

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (l)	4.25c
San Francisco	4.05c
Seattle (l)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati,	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.55c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Birmingham	5.20c
Buffalo	5.45c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York‡ (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Birmingham	4.05c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅜ & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 18

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$30.00 6 0 0	$20.95	2 12 0
Basic bessemer	.....	20.95	2 12 0
Hematite, Phos. .03-.05	36.25 7 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$39.38 7 17 6	$43 20	5 7 6
Wire rods, No. 5 gage	54.13 10 16 6	49.22	6 2 6
FINISHED STEEL			
Standard rails	$50.63 10 2 6	$46.20	5 15 0
Merchant bars	2.73c 12 5 0	2.18c to 2.28c	6 0 0 to 6 5 0
Structural shapes	2.37c 10 12 6	1.96c	5 7 6
Plates, †¼ in. or 5 mm.	2.58c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm	3.34c 15 0 0	3.18c	8 15 0††
Sheets, gal., 24 gage, corr.	4.18c 18 15 0	4.01c	11 0 0
Bands and strips	3.07c 13 15 0	2.37c	6 10 0
Plain wire, base	4.35c 19 10 0	2.54c	7 0 0
Galvanized wire, base	5.18c 23 5 0	3.18c	8 15 0
Wire nails, base	4.13c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	$ 6.00 1 4 0	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$26.50 5 6 0(a)	$18.84	554	$25.84	760	$25.47 63
Basic bessemer pig iron	25.00 5 0 0(a)	.....	.....	.....	.....	28.10 (b) 69.50
Furnace coke	9.38 1 17 6	6.43	189	7.31	215	7.78 19
Billets	39.38 7 17 6	25.76	757.50	32.64	960	39.01 96.50
Standard rails	2.26c 10 2 6	1.62c	1,080	2.06c	1,375	2.38c 132
Merchant bars	2.55c 11 9 0	1.49c	995	1.65c	1,100	1.98c 110
Structural shapes	2.46c 11 0 6	1.46c	970	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.61c 11 14 3	1.86c	1,240	2.06c	1,375	2.29c 127
Sheets, black	3.51c 15 15 0§	2.25c	1,500§	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.35c 19 10 0	3.38c	2,250	2.85c	1,900	6.66c 370
Plain wire	4.35c 19 10 0	2.28c	1,520	2.48c	1,650	3.11c 173
Bands and strips	2.72c 12 4 0	1.68c	1,120	2.33c	1,550	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlesbrough. b hemetite. ††Close annealed.

**Gold pound sterling carries a premium of 65.3 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham,† No. 1	14.00
Birmingham,† No. 2	13.00
Bos. dock No. 1 exp.	13.00-13.50
N. Eng. del. No. 1..	13.50
Buffalo, No. 1.....	13.00-13.50
Buffalo, No. 2.....	11.50-12.00
Chicago, No. 1	12.00-12.50
Cleveland, No. 1....	12.50-13.00
Cleveland, No. 2....	11.50-12.00
Detroit, No. 1.....	9.00- 9.50
Eastern Pa., No. 1..	13.50-14.00
Eastern Pa., No. 2..	12.00-12.50
Federal, Ill.	12.00-12.50
Granite City, R. R..	13.00-13.50
Granite City, No. 2.	12.00-12.50
New York, No. 1 ...	†13.00
N. Y. dock No. 1 exp	13.00-13.50
Pitts., No. 1 (R. R.)	14.00-14.50
Pitts., No. 1 (dlr.)..	13.50-14.00
Pittsburgh, No. 2...	12.50-13.00
St. Louis, R. R.....	13.00-13.50
St. Louis, No. 2.....	12.00-12.50
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Seattle, No. 2	7.00
Toronto, dirs. No. 1.	12.00
Toronto, No. 2	11.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers ...	11.50-12.00
Chicago, factory ...	11.00-11.50
Chicago, dealer	10.50-11.00
Cleveland	12.00-12.50
Detroit	9.75-10.25
E. Pa., new mat. ...	13.50-14.00
E. Pa., old mat.	10.50-11.00
Pittsburgh	13.50-14.00
St. Louis	8.50- 9.00
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	9.50-10.00
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Pittsburgh	13.00-13.50
St. Louis	7.25- 7.75
Toronto, dealers ..	8.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	7.50- 8.00
Detroit	6.50- 7.00
St. Louis	6.75- 7.25

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	18.00-18.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	16.00-16.50

STEEL RAILS, SCRAP

Boston district	†12.00
Buffalo	15.50-16.00
Chicago	12.00-12.50
Cleveland	16.50-17.00
Pittsburgh	14.50-15.00
St. Louis	13.00-13.50
Seattle	10.00

STOVE PLATE

Birmingham	9.50-10.00
Boston district	†7.00
Buffalo	11.50-12.00
Chicago, net	9.00- 9.50
Cincinnati, dealers..	6.50- 7.00
Detroit, net	8.50- 9.00
Eastern Pa.	12.00-12.50
New York, fdry. ...	†8.50- 9.00
St. Louis	10.00-10.50
Toronto, deal'rs, net	10.00

SPRINGS

Buffalo	18.00-18.50
Chicago, coil	17.50-18.00
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	17.00-17.50
St. Louis	15.50-16.00

ANGLE BARS—STEEL

Chicago	14.50-15.00
St. Louis	15.00-15.50

RAILROAD SPECIALTIES

Chicago	16.00-16.50

LOW PHOSPHORUS

Buffalo, crops	18.50-19.00
Cleveland, crops ...	19.50-20.50
Eastern Pa., crops..	19.00-19.50
Pittsburgh, crops...	18.00-18.50
Pittsburgh, crops ..	17.00-17.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	13.00-13.50

SHOVELING STEEL

Federal, Ill.	12.00-12.50
Granite City, Ill. ...	12.00-12.50
Toronto, dealers....	10.00

RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district	†9.00- 9.50
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	13.00-13.50
Chicago, No. 1 net..	10.50-11.00
Cincinnati, No. 2...	10.50-11.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1....	9.50-10.00
St. Louis, No. 2	13.00-13.50
Toronto, No. 1 dlr...	16.00

SPECIFICATION PIPE

Eastern Pa.	13.50-14.00
New York	†9.50-10.00

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	11.00-11.50
Cincin., No. 1, deal..	9.50-10.00
Cincinnati, No. 2...	4.50-5.00
Cleveland, No. 2...	8.50- 9.00
Detroit, No. 1, new.	9.00- 9.50
Valleys, new, No. 1	12.50-13.00
Toronto, dealers....	9.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	9.00- 9.50
Chicago	7.00- 7.50
Cincinnati, dealers..	6.50- 7.00
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
Eastern Pa.	8.50- 9.00
New York	†6.50- 7.00
Pittsburgh	7.50- 8.00
St. Louis	6.00- 6.50
Toronto, dealers ...	8.00- 8.50
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†3.50- 4.00
Buffalo	9.00- 9.50
Cincinnati, dealers..	5.50- 6.00
Cleveland	9.00- 9.50
Detroit	6.00- 6.50
Eastern Pa.	8.00- 8.50
New York	†4.50- 5.00
Pittsburgh	7.50- 8.00
Toronto, dealers	8.00- 8.50

CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem...	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	9.00- 9.50
Chicago	7.00- 7.50
Cincinnati, dealers..	5.50- 6.00
Cleveland	9.00- 9.50
Detroit	6.00- 6.50
E. Pa., chemical....	12.00-12.50
New York	†4.50- 5.00
St. Louis	6.00- 6.50
Toronto, dealers....	9.00

PIPE AND FLUES

Cincinnati, dealers..	7.50- 8.00
Chicago, net	8.50- 9.00

RAILROAD GRATE BARS

Buffalo	9.50-10.00
Chicago, net	9.00- 9.50
Cincinnati	6.50- 7.00
Eastern Pa.	12.00-12.50
New York	†9.00- 9.50
St. Louis	10.00-10.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	11.50-12.00
Cleveland	12.50-13.00
Detroit	8.50- 9.00
Pittsburgh	12.50-13.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	16.00-16.50

ARCH BARS, TRANSOMS

St. Louis	17.00-17.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	13.00-13.50
Chicago, elec. fur...	12.50-13.00
Eastern Pa.	12.00-12.50
St. Louis	10.00-10.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	18.00-18.50
Boston district	†14.00
Chicago, net	18.00-18.50
Eastern Pa.	20.50-21.50
St. Louis	19.50-20.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	17.00-18.00
Boston dist., iron...	†10.50
Buffalo, steel	18.50-19.00
Chicago, iron	15.00-15.50
Chicago, rolled steel	15.50-16.00
Cincinnati, iron	15.50-16.00
Eastern Pa., iron..	16.50-17.00
Eastern Pa., steel..	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel....	17.00-17.50
St. Louis, iron	16.00-16.50
St. Louis, steel	15.00-15.50

NO. 1 CAST SCRAP

Birmingham .	15.50-16.00
Boston, No. 1 mach.	†12.25
N. Eng. del. No. 2..	12.00
N. Eng. del. textile.	15.50-16.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	14.50-15.00
Chicago, agri. net..	11.00-11.50
Chicago, auto	12.00-12.50
Chicago, railr'd net	11.50-12.00
Chicago, mach. net.	12.50-13.00
Cincin., mach. cup...	11.50-12.00
Cleveland, mach....	17.00-17.50
Eastern Pa., cupola.	16.00-16.50
E. Pa., mixed yard.	13.50-14.00
Pittsburgh, cupola..	16.50-17.00
San Francisco, del..	13.50-14.00
Seattle	8.00
St. Louis, No. 1....	12.75-13.25
St. L., No. 1, mach.	13.75-14.25
Toronto, No. 1, mach., net	14.00-15.00

HEAVY CAST

Boston dist. break..	†9.50
N. Eng., del.	12.50-13.00
Buffalo, break	11.50-12.00
Cleveland, break....	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net...	12.50-13.00
Eastern Pa.	14.00-14.50
New York, break. ..	†10.50-11.00
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	14.00-14.50
Chicago, R. R.	14.50-15.00
Cincin., agri. del...	11.50-12.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R. ..	16.50-17.50
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	17.00-18.00
Boston	†12.00
Chicago	14.50-15.00
Eastern Pa.	18.50-19.00
New York	†15.50-16.00
St. Louis	13.75-14.25

LOCOMOTIVE TIRES

Chicago (cut)	16.50-17.00
St. Louis, No. 1 ...	15.00-15.50

LOW PHOS. PUNCHINGS

Buffalo	17.50-18.00
Chicago	15.50-1600
Eastern Pa.	18.00-18.50
Pittsburgh (heavy).	16.50-17.00
Pittsburgh (light)..	15.50-16.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer.....	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	nominal
Swedish low phos.	nominal
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton, unit, duty paid...nom.	$24.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% ..... non.	45.00
So. African, 50-52% ..... non.	45.00
Indian, 50-52%	Nominal

—The Market Week—

Sheets

Sheet Prices, Page 76

Pittsburgh—With November now half gone, sellers report incoming business is in danger of falling behind October volume, although, of course, a few large orders could make the picture more comparable. While demand from all sources is spotty, some consumers apparently are more active than are sheet steel producers. In view of this, some replacement business may be expected over the balance of this month, although any marked upturn in buying can hardly be expected until first quarter at least. Export inquiry remains good. For shipment to Australia, around 1700 tons of sheets were bought in this district recently. Operations of common and full finished mills on the national scale are down to around 43 per cent, with galvanized mills only slightly higher at 45 per cent. Prices are generally reported firm in the primary market.

Cleveland — Specifications of hot and cold-rolled material continue well below shipments despite the fact finishing operations have declined considerably over the past 30 days. Consumer stocks, while considered normal during the summer months, are far out of proportion to recent requirements. This condition is further accentuated by the continued decline in operations among many consumers. If specifications continue at the present volume through the next 30 days, producers will be forced to carry over in first quarter considerable tonnage formerly scheduled for fourth quarter delivery. Prices are firm.

Chicago—Sheet producers look for a small gain in buying soon as stocks of consumers are being depleted. Automotive orders still are light. Delivery on hot-rolled annealed, cold-rolled and galvanized sheets is two to three weeks, the minimum time required for shipment of such material. Hot-rolled sheets are available in one to two weeks.

Boston—Sheet consumption by industrial fabricators has receded, which is reflected in lower specifications with car lot shipments few. Jobbers, distributing a good part of the tonnage in this district, are experiencing light demand, which tends to curtail buying for warehouse as the latter are gradually lowering inventories. Mill prices are firm, but some resellers are shading.

New York—One encouraging feature of an otherwise dull sheet market is a fairly good movement in

THINNER WALLS
QUICKER HEATING
LOWER FUEL COSTS

ABOVE: *Interior of pot-type annealer described below. The illustration shows Armstrong's Insulating Fire Brick installed on walls and arch.*

BELOW: *Exterior view of same furnace. Armstrong's N-16 and EF-22 Insulating Fire Brick provide efficient and economical insulation.*

EFFICIENT insulation is provided in the furnace shown above by the use of Armstrong's Insulating Fire Brick on the interior walls and arch. The furnace is a pot-type annealer constructed by the Whiting Company for the James Manufacturing Company, Fort Atkinson, Wisconsin.

Armstrong's Insulating Fire Brick offer many important advantages to furnace builders and plant supervisors because they combine the service secured from fire brick with the fuel savings of insulating brick. They permit thinner walls and consequent larger hearth area. Their light weight makes them ideal for arch work. And because of their low heat capacity, these brick permit the furnace to come to temperature more quickly.

Use of Armstrong's Brick in furnaces of all types, assures a more rapid turnover with less investment in furnace capacity, as well as definite fuel savings. Armstrong's Line of Insulating Fire Brick includes five types covering a complete range of temperatures and uses, behind the refractory and for direct exposure. For full information, and for your copy of the new, illustrated booklet, write Armstrong Cork Products Co., Building Materials Div., 985 Concord Street, Lancaster, Pa.

Armstrong's

HIGH TEMPERATURE INSULATION

galvanized sheets. This is attributed primarily to favorable weather conditions, which have permitted small building work, such as repairs and alterations, to go forward. Mill representatives report that jobber replacements of galvanized sheets well exceed those in any other line of sheets.

Philadelphia — Automotive sheet specifications continue restricted but the trade is somewhat encouraged by reports of moderately increasing retail automobile sales. Requirements of other consumers also are restricted. As an example, one of the large radio manufacturers and an important consumer of hot-rolled sheets is experiencing a sharp slackening in demand for its products and has laid off a substantial number of employes. All sheet-makers are able to make prompt delivery on practically all classifications although galvanized still runs around two or three weeks. Prices are firm since producers remain of the opinion that reductions would bring out no more business.

Youngstown, O. — Scattering orders for steel sheets are coming to the mills, largely from miscellaneous sources. Few are of ordinary size. Since most sheet mills here have worked off cleanly their former backlogs, they now are resorting to the bunching of orders. Shipments are going forward from mills just as released by needy consumers. The auto trade is conspicuously absent from the market except for special lots wanted in a hurry.

Cincinnati—Sheet demand has tended downward, affecting major consumers and miscellaneous requirements. A general policy of conservative buying has worked against interest in first quarter needs.

St. Louis—Sheet specifications have improved slightly during the past week or ten days, but new business is extremely light. New orders are small and come chiefly from miscellaneous users. Mill backlogs have been drastically cut and output has been adjusted accordingly. The seasonal betterment in the movement of galvanized to the south has failed to materialize. Tin plate is steady.

Birmingham, Ala. — Southern mills continue to turn out a large tonnage of sheets, with no appreciable recession. Mills are working at practically capacity on sheets.

Navy Awards Chain

New York—Morse Chain Co., Ithaca, N. Y., has been awarded chain and socket carrier links for the navy, delivery Washington, at $22,107.80, schedule 1877. Bethlehem Steel Co. under the same opening was awarded the contract for hexagon steel nuts for Philadelphia at $11,725.90, delivered.

Strip

Strip Prices, Page 77

Pittsburgh — Incoming business this month in hot and cold-rolled strip steel has been behind the corresponding October period. Demand for carbon grades is reported weak. Stainless grades have held up well this month until the last few days. Sellers anticipate a fair rate of activity around the first of the year. On the national scale, hot strip mills are operating around 40 per cent, and cold strip mills, around 39 per cent.

Cleveland — Inventories of most consumers of hot or cold-rolled strip are still far out of proportion to current requirements. This condition is further accentuated by continued decline in operations of many consumers. Demand from automobile suppliers is particularly disappointing, and little improvement is anticipated soon. Mill operations have receded to new low levels. Base prices remain steady, although some weakness is noted among jobbers.

Chicago—Strip demand still is retarded by stocks in hands of some consumers though occasional orders are being received from customers who have been out of the market for a number of weeks. Automotive buying is unimproved and in view of restricted operations of some interests, strip orders are expected to continue slow. Mill operations are supported by day-to-day business and early shipment can be made.

Weirton Steel Co., Weirton, W. Va., has been awarded 217 tons, strip steel for the Rock Island, Ill., arsenal under proposal 267, bids Nov. 3 at 3.62c, delivered, for item 1, and 3.52c, item 2.

Boston—Narrow cold strip buying is barely sustaining mill operations at an average of 40 per cent capacity. The character of buying is unchanged, small diversified orders for prompt shipment. Producers now expect little change until after the turn of the year.

New York—Cold strip buying is irregular and slow as manufacturing consumers of narrow widths continue to operate largely on stocks which in numerous instances are heavier than was generally believed. Jobbers are releasing few specifications. Mill operations are lower and uneven. Fill-in buying in small lots for immediate delivery accounts for practically all incoming volume. Prices are steady. Hot-rolled demand is also in the doldrums.

Philadelphia—Prospects are poor for much renewed interest in narrow strip over the balance of the year since practically all consumers are covered for at least this period. Quotations continue steady.

Birmingham, Ala.—While somewhat off from preceding weeks, demand for strip continued brisk. Cotton ties leads the strip demand.

Plates

Plate Prices, Page 76

Pittsburgh — Small orders for repair programs and tank work have made up most of the new business in plates recently. Absence of railroad requirements has been felt keenly in the last few weeks, with backlogs now depleted and jobbers and miscellaneous sources hesitant to make commitments other than the necessary ones. Export inquiry is fair, but prices are well below levels prevailing earlier this year. Barge work remains inactive. Domestic prices are reported holding up well in the primary market. Deliveries are prompt.

Cleveland — Plate requirements are anything but encouraging, with the producer here closed for some time and other sellers reporting only a moderate easing of the rate of the current recession. Some ship repair work, consisting of boiler heads and other miscellaneous requirements, may materialize within the next two weeks.

Chicago — Tank fabricators are operating only slightly below the year's peak but backlogs have been reduced and lighter schedules are in prospect. Poor demand for plates from railroads is holding production at a low rate, with little possibility seen of any material increase the next 60 days. Mills' backlogs are light and delivery in one week is available.

Boston — Plate buying continues slack and irregular, reflecting fabricating demand. Consumers are not as heavily stocked as users of the steel products. Several hundred tons are involved in the annual replacement buoy program of the lighthouse bureau. Railroad and tank needs are small. Plate orders are frequently lumped with other steel products for full car shipments. The price is now 2.66c, Boston.

New York — Oil refinery work of moderate proportions features the domestic plate market. Most of this is expected to be bought within a fortnight. Some export inquiry is current but prices are too low to

be tempting, figuring back to less than 2.10c, base.

Philadelphia — No improvement is noted in demand for plates and this is reflected in operations of independent producers. Orders for more than a carlot are a rarity and, in fact, probably 50 per cent or more are for less-carlots. Standard Oil Co. of New Jersey is reported inquiring for one tanker taking about 4000 tons. Bids also have gone in on steel for two battleships, one of which will be built here, but the material will not be required for some time.

Birmingham, Ala.—Shipments of plates continue somewhat above the average for the past few weeks, and show some improvement over last week. With the exception of sheets and cotton ties, plates probably are in largest demand in the southern district.

San Francisco — Plate business calls for a small tonnage. It is expected that a call for bids for close to 10,000 tons for penstocks for the Grand Coulee dam in Washington, will come up for figures before the end of the year.

Seattle — Several important projects are to be out for bids soon. Meanwhile shops are operating only part time. Bids are asked by quartermaster, Fort Lewis, Wash., Nov. 20, for completion of balloon hangar. Othello, Wash., is awaiting PWA approval of plans for proposed 75,000-gallon steel water tank, plans by Allan R. Scott, Spokane.

Plate Contracts Placed

150 tons, elevated tank, town of Preble, Brown county, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

114 tons, Norfolk navy yard, to Worth Steel Co., Claymont, Del.; bids Oct. 22; schedule 1858, lot 505.

Plate Contracts Pending

200 tons, pipe line, Niles Center, Ill.

100 tons, welded or riveted steel water tank, 48 feet diameter, 30 feet high, Esopus, N. Y.; bids Nov. 26, Sanborn & Bogert, New York, consulting engineers. Dresden, N. Y., closes Nov. 23 on smaller steel water tank.

Unstated, penstock and appurtenances, Owyhee project; bids to bureau of reclamation, Denver, Nov. 24.

Bars

Bar Prices, Page 76

Pittsburgh — Carbon and alloy bar producers continue to await an upturn in orders, fully aware of the probability that any extensive increase could hardly be expected until first quarter, at least. Tonnage bookings have been infrequent since September. However, it appears that the consumers are depleting stocks and some may find it neces-

The OHIO SEAMLESS TUBE CO.
OHIO SPECIAL QUALITY
Shelby, OHIO

SEAMLESS MECHANICAL TUBING . . . Carbon and Alloy Steels.

SEAMLESS PRESSURE TUBING . . . Boiler Tubes, Merchant and Locomotive Heat Exchanger and Condenser Tubes in Plain Carbon, Special Alloy or Toncan Iron.

SEAMLESS AIRCRAFT TUBING . . . SAE 4130X and SAE 1025 to Government Specifications in "Ohio Special" Non-Oxidized Surface Finish.

ELECTRIC WELDED TUBING . . . For all Mechanical Purposes.

UPSETTING — FLANGING — TAPERING AND BENDING

sary to make replacements before long.

Cleveland — Producers of carbon and alloy steel bars have not reported any improvement in requirements as most consumers have more than ample stocks for immediate needs. This condition is not limited to any one group serving a particular industry, but is reflected in the decreased operations of practically all consumers, even those serving the agricultural implement industry. Absence of specifications from auto manufacturers is keenly felt here, as most forging concerns have built up considerable stocks in anticipation of more active demand from this channel.

Boston—Four mills bid 4.785c, delivered, on 135 tons of nickel-steel bars, Charlestown navy shops, Boston, the award to be made this week. Two quoted 4.985c, delivered. Material is for chainmaking. Demand for carbon steel bars continues dull, prompt delivery being made. Alloy, forging and cold-finished stock, while slower, appear to be less heavily stocked by consumers and business is confined mostly to fairly numerous small specifications. Soft steel bars are steady at 2.86c, Boston.

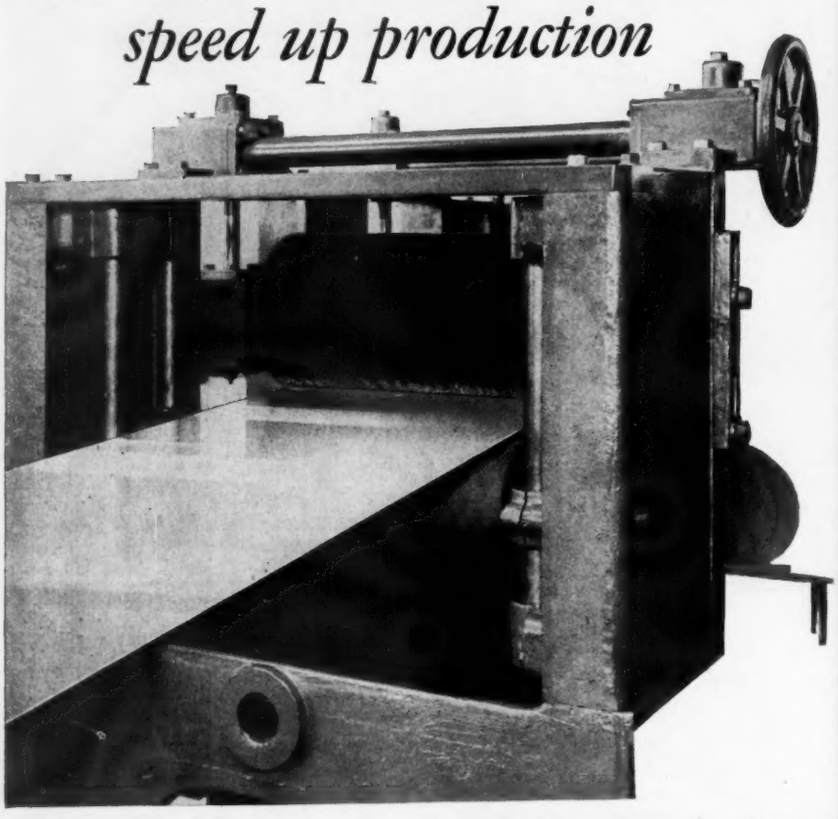
Chicago — While steel bar demand still is slow, the appearance of occasional rush orders indicates that consumers are nearing the end of their stocks. Automotive buying is unimproved, holding at a relatively slow rate. Needs of farm equipment manufacturers are off moderately but remain seasonally heavy. Prompt delivery generally can be given on new bar business.

Springfield, Mass., armory closes Nov. 23 on 145 tons alloy steel bars, including 100 tons of heat treated stock, 1 15/16-inch diameter. Bulk of the remainder is hot rolled acid manganese steel bars for rifle barrels.

New York — While slack, commercial bar demand is at least holding steady. Leading sellers assert that over the past fortnight or so there has been little fluctuation, with volume, if anything, a shade heavier. Orders are more numerous although amounts involved are so small that the net gain in volume, if there is a gain, is barely negligible. Light specifications from railroads and bolt and nut manufacturers are still the rule.

Philadelphia — The bar market maintains a relatively better appearance than that for other steel products, according to sellers, due to the diversity of outlets. However, aggregate bar tonnage continues restricted with practically all interests offering almost immediate delivery on standard sizes and specifications. Crucible Steel Co. of America, New York, is low on 70,000 feet cold-drawn rod, bids Nov. 2, proposal 376, for Frankford arsenal.

NEW SPIRAL WOUND BRUSHES
speed up production



● Don't fail to investigate the new Even Trim Spiral Wound Wire Brushes now being used in the production of light gauge metal.

These new Spiral Wound Brushes of nickel silver wire recently developed by the Brush Division of the Pittsburgh Plate Glass Company, not only help to speed up production but to reduce finishing costs as well. But that's not all! They provide a product of *more uniform quality.* The spiral winding of the brush permits of right-angled brushing which practically insures the elimination of brush marks.

EVEN TRIM Spiral Wound Brushes are made of tampico or horsehair, as well as wire. And all are *refillable.*

Write today for further information. Our engineering staff will be glad to work with you in developing Spiral Wound Brushes to meet your needs.

PITTSBURGH
PLATE GLASS COMPANY
BRUSH DIVISION • BALTIMORE, MD.

Pipe

Pipe Prices, Page 77

Pittsburgh—While demand for oil country goods is holding up fairly well this month, in comparison to October, other lines have appeared slightly weaker. One producer is maintaining 55 to 60 per cent operations, largely due to oil country orders, which in the case of this seller have been slightly ahead of the corresponding October period. Plans for pipe line extensions continue to develop. Cabot Gas Corp., Rochester, N. Y., is planning a 24-inch welded gas line from Olean, N. Y., to Rochester. Standard Oil Co. of Ohio is reported planning a 15-mile 4-inch welded line from Latonia, Ky., to Cincinnati.

Cleveland — Pipe jobbers report the rate of recession in sales and shipments so far this month has shown signs of slowing. Most dis-

tributors have ample stocks for current requirements. Miscellaneous small expansion programs from industrial sources has been the largest factor in current demand. Residential requirements have been particularly disappointing.

Chicago—Chicago delivered prices on cast iron pipe are up 20 cents a net ton as a result of recent freight rate advances. The market now is $57.20 to $58.20 for 4-inch pipe and $54.20 to $55.20 for 6 to 24-inch material. Orders continue slow but prospective business is moderately heavier.

Boston — Cast pipe inquiry is heavier, bids closing this week on 1430 tons, the bulk for a Maine water district, 1255 tons. This is the largest tonnage estimated for several months, Hartford, Conn., is also considering figures on a substantial volume. Buying is still confined mostly to small miscellaneous lots. Merchant steel pipe is moving slowly.

New York—Cast pipe buying centers around miscellaneous small lots shipped mostly from stock and foundry operations are declining in the east. Two upstate inquiries, Esopus and Dresden, N. Y., call for more than 1000 tons, 6 to 10-inch. These are the largest inquiries in several weeks. New York city is expected to ask bids this week on 300 tons of 12-inch, to be followed by a larger tonnage later for yard stocks.

Youngstown, O. — Receipt of the 750-ton Philadelphia water-line order has started the electric-welded mill at Brier Hill works of Youngstown Sheet & Tube Co. Oil country demand is sustaining seamless tube mill operations here as elsewhere, but even the small-diameter pipe requirements today are somewhat less than last month and a 500-ton order now looks big.

Birmingham, Ala.—Although pipe makers are optimistic because of renewed inquiry, business at the moment is particularly light and sufficient only for three to four day a week operations.

San Francisco—Outlook for balance of the year is unencouraging and little new business is expected. The largest letting went to United States Pipe & Foundry Co. and involved 400 tons of 24-inch pipe for Bellingham, Wash. This company was also low bidder on 383 tons of 6-inch pipe for Oakland, Calif., while American Cast Iron Pipe Co. was low on 332 tons of 8-inch pipe for the same city. The bureau of reclamation at Denver will open bids Nov. 22 for about 100 tons of ½ to 6-inch black and galvanized steel pipe under invitation 38,470-A for delivery at Odair, Wash. Awards for the year now total 25,514 tons, compared with 43,317 tons for the same period a year ago.

Seattle — As soon as PWA approval is received, Seattle will call bids for the Ninth avenue SW improvement to cost $225,000 and involving 61,500 feet of 8-inch cast iron about 1500 tons. Several other Seattle projects will be up soon.

Cast Pipe Placed

400 tons, 24-inch, class 150 pipe, Bellingham, Wash., to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, water system, Preble, Wis.; to James B. Clow & Sons Co., Chicago, at $70,000.

Cast Pipe Pending

1255 tons, 6 to 12-inch, Hampden, Me., water district; bids Nov. 27.

715 tons, 6 and 8-inch, East Bay municipal utility district, Oakland, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low on 383 tons of 6-inch, and American Cast Iron Pipe Co., Birmingham, Ala., low on 332 tons of 8-inch pipe.

575 tons, 6, 8 and 10-inch for Three Forks, Mont.; bids Nov. 29.

328 tons, 24-inch, industrial line, Bellingham, Wash.; bids in.

175 tons, 12-inch, Lincoln, Mass.; bids Nov. 26.

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Unstated tonnage, 225,000 feet of 6 to 16-inch water pipe, Lake, Wis.; bids close Nov. 22.

Wire

Wire Prices, Page 77

Pittsburgh — Demand continues moderate for wire products and operations are slightly lower, an adjustment to actual incoming business. Pittsburgh Steel Co., Pittsburgh, was low bidder on 60 miles of chain link fence for the Colorado river aqueduct of the metropolitan water district of Southern California. Bids were opened Nov. 15. The whole job of 150 miles of erected fence will require 2600 tons of fence and posts. Wire prices generally are reported holding firm in the primary market.

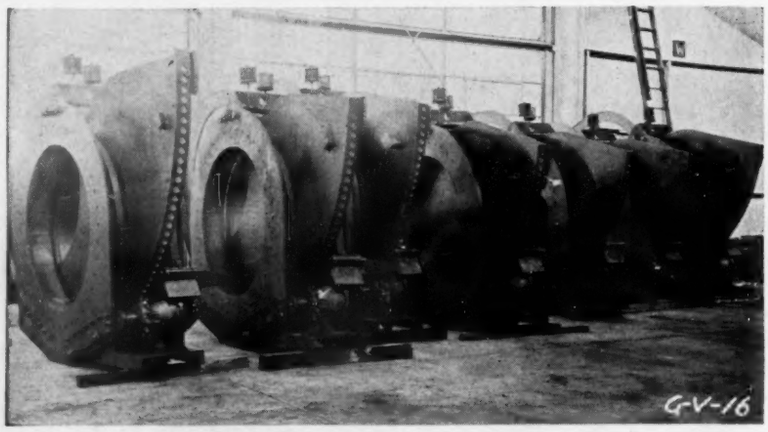
Cleveland — Demand for merchant and manufacturers' wire is unchanged. Mills have drastically curtailed operations in many departments, although a few are still supported by backlogs. Nut and bolt and other consumers of manufacturing wire serving the auto trade are apparently well stocked and are receiving only a few minor releases from this channel. Prices remain firm.

Chicago—Despite steady reduction of inventories by wire consumers during the past 60 days, new business is slow to appear. Consumption of manufacturers' wire continues to recede, with only moderate support provided by automotive needs. Ample stocks of jobbers of merchant wire products are restricting new business from that direction.

Boston—The spotty character of buying is reflected in wire mill operations, incoming volume showing no improvement and barely holding the slow rate of recent weeks. Buying continues well diversified, but orders are small and usually for immediate delivery. Demand for manufacturers' wire is confined entirely to fill-in requirements. Mill finishing operations range from 40 to 45 per cent of capacity which is higher than ingot and billet schedules. Prices are firm.

New York—Wire orders continue small individually, for prompt shipment, but well diversified. The aggregate tonnage of new business is light and finishing mills are not operating better than 40 per cent as a rule. Consumers are drawing on stocks where possible to lower year-end inventories, buying fill-in needs to cover gaps in stocks. Mills are well supplied with accumulated stocks of rods and semifinished steel.

Birmingham, Ala. — Slight improvement continues in demand for wire but the market has failed to offer anything like the anticipated business. Jobber stocks are particularly light and there is reason to believe a renewed buying season is imminent.



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Rails, Cars

Track Material Prices, Page 77

Louisville & Nashville has awarded 21,000 tons of rails to Tennessee Coal, Iron & Railroad Co. and Southern Pacific has given the same producer 20,405 tons, Bethlehem Steel Co. 7682 tons and Colorado Fuel & Iron Co. 7244 tons. The Tennessee company has booked export orders for about 8000 tons of rails for export. This mill now has about 61,000 tons of rails on books.

Atlantic Coast Line is understood to be inquiring for about 20,000 tons, Northern Pacific is expected to enter the market for 25,000 to 30,000 tons and the Great Northern for 20,000 tons.

Atchison, Topeka & Santa Fe has

decided to abandon its car rehabilitation program, involving 5000 freight cars, which had been scheduled to be issued this month. The Delaware, Lackawanna & Western has also withdrawn its inquiry for 500 hopper cars.

Philadelphia Rapid Transit, recently noted as in the market for 40 trackless trolleys, is asking bids on 20 additional trolley cars.

Rail Orders Placed

Louisville & Nashville, 21,000 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Car Orders Placed

Boston Elevated Railway, 10 trackless trolleys to Pullman-Standard Car Mfg. Co., Chicago.

Locomotives Placed

Chicago, Burlington & Quincy, five locomotives, to its own shops.

Car Orders Pending

United States engineer, Honolulu, 300 special steel cars, presumably of industrial type; bids close Dec. 28.

Locomotives Pending

Chicago, Milwaukee, St. Paul & Pacific, seven locomotives, including five of the 5-6-4 type and two of the Hiawatha type; tentative figures being asked.

Buses Booked

A. C. F. Motors Co., New York: Fifteen 35-passenger for Memphis Street Railway Co., Memphis, Tenn.; twelve 41-passenger for Queens-Nassau Transit Lines Inc., Woodside, N. Y.; six 36-passenger for Florida Motor Lines Corp., Jacksonville, Fla.; two 37-passenger for Fitchburg & Leominster Street Railway Co., Fitchburg, Mass.

Twin Coach Co., Kent, O.: Twelve 25-passenger for Wisconsin Public Service Co., Green Bay, Wis.; four 25-passenger for Pacific Gas & Electric Co., Sacramento, Calif.; three 31-passenger for Omaha & Council Bluffs Street Railway Co., Omaha, Nebr.; two 23-passenger for Market Street Railways, San Francisco; two 24-passenger for Steubenville, East Liverpool & Beaver Valley Traction Co., East Liverpool, O.

Shapes

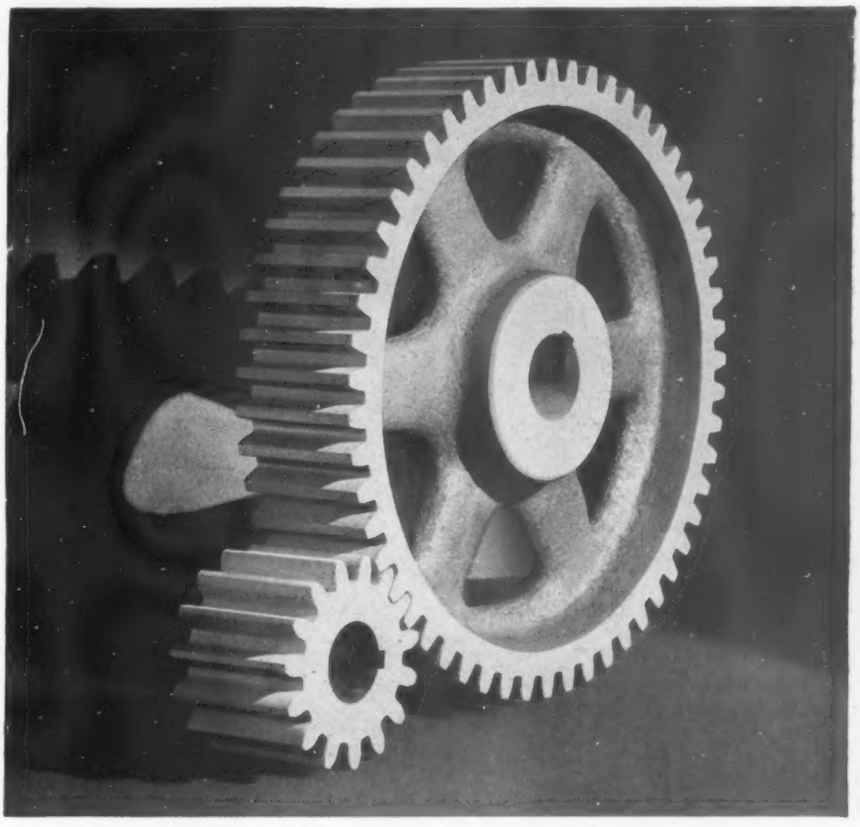
Structural Shape Prices, Page 76

New York — Including small lots, structural steel awards do not top 5000 tons, and of that tonnage, 1650 tons are for New York city schools, bid direct. Fabricated structural steel prices are under pressure and generally lower than several weeks ago. New work is less active with 2500 tons for the Canal street bridge, Manhattan, expected out for figures shortly. Although state bridge requirements for New Jersey are slightly heavier, the total volume of such tonnage is lower, while private construction has dropped materially.

Pittsburgh—Recent inquiries for structural shapes include 950 tons for the University hospital here in Pittsburgh. American Bridge Co., Pittsburgh, has booked 510 tons for a grade crossing separation at Camillus, N. Y. Awards over 1000 tons have been infrequent during the past week.

Cleveland — Large structural awards have been noticeably absent from both private and structural sources. However, small lots ranging up to 50 tons for miscellaneous plant expansions is encouraging and has aided materially in keeping small fabricators comparatively active. Considerable tonnage is involved in state bridge requirements, but no awards have been made. Mill prices have remained firm.

Chicago—Bids close Dec. 3 on 3100 tons of a Mississippi river bridge at LaCrosse, Wis., the largest of new inquiries. Pennsylvania railroad has placed 4586 tons of sheet piling and 525 tons of bearing piles for a dock at Sandusky, O. Other piling orders



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Behind the Scenes with STEEL

Thimblefuls

■ Buzzing around our desk for the past week have been derisive letters from metal men, wanting to know if Bethlehem Steel company has entered the pin & paper clip business. All this haranguing came as a result of that innocent looking picture on page 60 of last week's book. Said the head, "Hot Metal Mixer Has Unusual Capacity," which was true with the usual interesting accuracy of STEEL's editorial content. True, however, entirely inadvertently, for the caption read "has capacity for 1200 pounds." Of course that nasty fellow, the printer, who makes 99 per cent of the errors made in this world, should have made it read 1200 tons, instead. We would never accuse the Bethlehem steelco of being so petty as to build a hot metal mixer so microscopic as stated. Unusual capacity, indeed. We apologize for the colossal stupidity of the printer who does not know enough to correct mistakes made by our editors.

♦

Dumb Jealousy

■ We heard a rumor to the effect that Charlie McCarthy will be the No. 1 dummy of the year, will be pronounced as Radio's #1 funny man and will subsequently get more and fatter pay envelopes. We heard also that Whitey Maurath's little lad is green with envy, although he claims loudly that he is no dummy and needs nobody's knee to sit on.

♦

Muddy Stuff

■ We, meaning this department, are *in receipt,* as the French say so naively, of a communication from Pete, the Puddler of Belmont Park, who wishes to call our attention to the fact that Racehorses in Australia run the Other Way, and that Whitey Maurath's Ad of a few seasons back would be Strictly Legitimate in that and other Territories. Agreed, say we, and let it rest at that. Pete, however, doesn't rest at that but wants to know who we'd like to see in the Rose Bowl. It's too early for that, according to our vice-president in charge of infallible predictions. Meanwhile, we'd like to see Mlle. de Fontanges in a Flower Pot. Quit puddling around Belmont, Pete, and try a dry track for a change.

♦

Rapid Tanking

■ From a seagoing gentleman in Michigan comes word that he has started to build some high-speed streamlined tankers for ocean oil hauling. Slightly short in funds, the gentleman has offered shares in the tankers to the public. Not stocks or bonds are these shares, but bills of sale, each for a specific part of the ship. We wish luck of all kinds to the venture, and express the hope with bated breath that the guy who holds title to the plate in the middle of the bottom doesn't decide to get sore and take back his piece in mid-ocean.

♦

Janusian

■ If you really want to know, the word atop this squib is our own coinage, and its definition is "an object, operation or other thing which looks backward analytically and forward speculatively without falling over its own feet." Reason for its birth at this point, the *raison d'etre* according to the language of Louie Quinzy et al, is to describe STEEL's super colossal yearbook which is now being built by innumerable editors, artists, stenographers and foreign offices. This *Janusian* effort is really Janusian, too, because its theme, awe-inspiring in its significance, points the way to greater profits in 1938, while giving out a backward look or two over what happened in the metal producing and metalworking industries during 1937. Now we're going out to drink the health of Janus, our patron saint, in foaming winter brew. Good day!

—SHRDLU

include 600 tons for a Peoria, Ill., dam. Inquiries for fabricated material continue light, with most awards limited to lots less than 100 tons.

Boston—More small projects, postoffices and schools, are out for estimates, but the aggregate tonnage pending is small. This type of work and tonnage involved are more favorable to the small district shops. Low prices on fabricating and erecting prevailed on much of the large tonnage work recently placed under contract. Bridge needs are lower with a minimum of fabrication required on considerable of this volume. Not much over 2000 tons is being figured or active in this district.

Philadelphia — Other than the Pennsylvania state program, which continues active, the market for structurals shows little life. The shapes for the finance buildings in Harrisburg have been placed with the Bethlehem Steel Co. While the state work is bringing some work to district fabricating shops, it has not prevented a further decline in operations.

San Francisco—A number of new inquiries requiring more than 1700 tons for structural material have come out for bids. This, together with other pending business, aggregates over 6400 tons. American Bridge Co. is reported low bidder on 600 tons for a crossing over the Los Angeles river, Los Angeles for the Union Pacific Co. Awards totaled 1456 tons and brought the aggregate for the year to 136,428 tons, compared with 149,529 tons last year.

Seattle—This section is the most active of the Pacific Northwest steel market. Shops are fairly busy and some important tonnages are developing. Washington state will receive bids Nov. 30 for the Skykomish river bridge. Bethlehem Steel Co., San Francisco, has been awarded a bus structure at the Bonneville powerhouse, bidding $30,473, tonnage unstated.

Shape Contracts Placed

5100 tons, unloading dock for Pennsylvania railroad, Sandusky, O.; 4586 tons

Shape Awards Compared

	Tons
Week ended Nov. 20	**21,736**
Week ended Nov. 13	**10,242**
Week ended Nov. 6	**57,885**
This week, 1936	**11,146**
Weekly average, 1936	**16,332**
Weekly average, 1937	**24,384**
Weekly average, October	**15,654**
Total to date, 1936	**1,035,357**
Total to date, 1937	**1,146,042**

Includes awards of 100 tons or more.

of sheet piling to Jones & Laughlin Steel Corp., 520 tons of bearing piles to Carnegie-Illinois Steel Corp., Pittsburgh.

4900 tons, finance building, Harrisburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; through McCloskey & Co., Philadelphia, general contractor.

1835 tons, viaduct section, New Jersey approach Lincoln tunnel, Weehawken, N. J. to Taylor-Fichter Structural Steel Co., New York.

1175 tons, public school 259, Brooklyn, N. Y., to Post & McCord, New York.

915 tons, not including steel doors, superstructure, hangars, municipal airport, Baltimore, to Lehigh Structural Steel Co., Allentown, Pa.; Kauffman Construction Co., Baltimore, general contractor.

850 tons, Vermilion Bayou bridge, Abbeville, La., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

830 tons, bridges, contract 6-No. 1142, Central Railroad of New Jersey, Elizabeth, N. J., to Harris Structural Steel Co., New York; Centaur Construction Co., Inc., New York, general contractor.

670 tons, bridge, route 281, Bucks county, Pennsylvania, to Phoenix Bridge Co., Philadelphia.

600 tons, piling, Illinois river dam, Peoria, Ill., to Inland Steel Co., Chicago.

530 tons, bridge, Union Pacific railroad, Los Angeles river, California, to American Bridge Co., Pittsburgh.

510 tons, grade separation, Belle Ilse crossing, Camillus, N. Y., New York Central railroad, to American Bridge Co., Pittsburgh.

500 tons, library building, New Rochelle college, New Rochelle, N. Y., to Ingalls Iron Works, Birmingham, Ala.

450 tons, public school 55, Queens, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

375 tons, state highway bridges RC-3813 and RC-2428, Central Bridge, N. Y., to Harris Structural Steel Co., New York.

356 tons, under crossing, Laramie county, Wyoming, to unnamed interests.

330 tons, warehouse No. 2, Owens-Illinois Glass Co., Streator, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, bridge, Connecticut river, Monroe, N. H., to Lackawanna Steel Construction Co., Buffalo; through O. W. Miller Co., Greenfield, Mass., general contractor.

300 tons, plant addition, National Gypsum Co., Mobile, Ala., to Rogers Structural Steel Co., Corry, Pa.

225 tons, warehouse, John Deere Plow Co., Indianapolis, to Mississippi Valley Structural Steel Co., Chicago.

200 tons, towers, aerial tramway, Franconia Notch, N. H., to American Bridge Co., Pittsburgh.

165 tons, factory No. 1, Owens-Illinois Glass Co., Streator, Ill., to Pittsburgh Bridge & Iron Works, Pittsburgh.

135 tons, store, Reading, Pa.,, to Reading Metalcraft Co., Reading, Pa.

130 tons, state highway bridge over Spruce creek, Kittery, Me., to American Bridge Co., Pittsburgh.

130 tons, Southold school, Long Island, N. Y., to Dreier Iron Works, Bronx N. Y.

125 tons, dormitory, Bryn Mawr, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, under-crossing, near Daly, Grand and Emery county, Utah., to unnamed interest.

Unstated, bus structure Bonneville powerhouse, to Bethlehem Steel Co., San Francisco.

Shape Contracts Pending

10,770 tons, shafts and tunnels, Putnam and Westchester counties, board of water supply, New York, three general contracts awarded low bidders.

3100 tons, Mississippi river bridge, La-Crosse, Wis.; bids Dec. 3.

2500 tons, bridge, Canal street, connecting link, Westside elevated highway, New York; bids soon, borough president, Manhattan.

950 tons, women's wing, University hospital, Pittsburgh.

650 tons, manufacturing building, General Motors Corp., Warren, O.

600 tons, bridge, Rock county, Wisconsin; A. A. Prendergast, Minneapolis, low bidder.

600 tons, operating gates, Fort Peck dam, Wiota, Mont.

573 tons, crossing over Los Angeles river, Los Angeles, for Southern Pacific Co., Los Angeles.

500 tons, gate and elevator hoists, Bonneville dam project; General Iron & Steel Works, Portland, Oreg., low.

315 tons, gymnasium, including swimming pool, Wellesley college, Wellesley, Mass.

300 tons, curbing, procurement officer, treasury department, New York.

300 tons, hospital building, Ellis hospital, Schenectady, N. Y.

270 tons, tuberculosis hospital, Hamburg, Pa. Karno Smith, Trenton, N. J.,

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low on general contract.
250 tons, state highway bridge, Rochester, N. Y.; bids Nov. 30, department of public works, Albany.
250 tons, Washington state Skykomish river bridge; bids at Olympia, Nov. 30.
220 tons, Washington state bridge, Wahkiakum county; bids at Olympia, Nov. 3.
235 tons, state highway bridge, Rochester, N. Y.; bids Nov. 30.
200 tons, grade crossing, B. & O. railroad, Akron, O.; bids in.
200 tons, structural angles, for Brooklyn and Philadelphia navy yard, schedule 2059; bids Nov. 16, Bethlehem Steel Co., Bethlehem, Pa., low.
200 tons, building, General Atlas Carbon Co., Guyson, Okla.
190 tons, underpass, Fargo, N. Dak.
183 tons, under-crossing near Redding, Shasta county, California; bids Dec. 1.
178 tons, bridge, route 25, section 3-C, Jersey City, N. J.; bids Nov. 22.
175 tons, chemistry building, Lowell Textile institute, Lowell, Mass.
150 tons, repairs to bridge 10.19, Pennsylvania railroad, Duquesne, Pa.
150 tons, distributing building, Kraft-Phoenix Cheese Corp., Pittsburgh.
143 tons, overpass, route 4, section 36, Monmouth county, New Jersey; bids Nov. 29.
125 tons, commercial building, H. L. Storch, River Forest, Ill.
125 tons, power house extension, Nebraska Power Co., South Omaha, Nebr.
125 tons, bridge, route 25, section 29, Kearny, N. J.; bids Nov. 22.
Unstated, state spans in Gallatin and Flathead counties, Montana; bids at Helena, Nov. 19.
Unstated, material for nine structural bridges, Rozza project, Wash., and spillway gates for Seminoe dam, Wyo.; bids to bureau of reclamation, Denver, Nov. 30.

Reinforcing

Reinforcing Bar Prices, Page 77

New York—Heavier requirements for New Jersey highways and bridges and a 500-ton inquiry for New York state roads, closing Nov. 30, bolsters declining reinforcing steel needs. Awards are lower with few sizable construction projects active. Some work has been withdrawn, including two sewage disposal plants, Hackensack, N. J. Active tonnage in the latter state approximates 1000 tons. Small-lot buying predominates with prices still weak.,

Pittsburgh—Contrary to conditions in numerous other divisions of the steel industry, producers of concrete bars find the outlook far from discouraging. Inquiries are reported holding up well. Knoxville Iron Co., Knoxville, Tenn., has been awarded 1160 tons for the bureau of reclamation project at Moxee City, Wash. Price weakness in concrete bars have been noted in many sections of the country.

Cleveland — Reinforcing awards have been limited to small tonnages, consisting mainly of joists, for new school buildings or additions. Most fabricators are carrying considerable excess stocks. The 375 ton award for the Pennsylvania railroad's dock is still pending. This is the only important project pending, although considerable tonnage is involved in miscellaneous state work in combination with a number of structural bridges. Prices are firm.

Chicago—New inquiries generally involve small lots but pending jobs are fairly numerous considering the restricted rate of general building activity. The largest of recent awards is 700 tons for a Chicago sanitary district sewer. Shading of prices on the more attractive inquiries continues.

Boston—Reinforcing steel out for estimates is the lightest in months, few projects taking more than 100 tons each. Highway and bridge needs have slumped and little road work is expected until next first quarter. Vermont continues to take figures on highway construction with little steel involved. Private industrial and commercial construction has dropped. Reinforcing steel prices continue soft even on smaller lots.

Philadelphia—Bids on the National Institute of Health project at Bethesda, Md., have been postponed to Dec. 3. A fair tonnage remains to be placed in connection with the Pennsylvania state institutional program. Considerable interest also is evidenced in the Sears, Roebuck & Co., store at Baltimore.

San Francisco—A fair volume of business has been placed and aggregated close to 2000 tons, bringing the total for the year to 88,447 tons compared with 218,556 tons in 1936. Important business included 653 tons for a by-pass in Sutter county, California, booked by Ceco Steel Products Corp.,

Seattle—Local mills are operating intermittently. Prospects are not encouraging, with business pending of small proportions and no large projects up for figures. Washing-

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Concrete Bars Compared

	Tons
Week ended Nov. 20	4,714
Week ended Nov. 13	3,640
Week ended Nov. 6	12,137
This week, 1936	2,706
Weekly average, 1936	6,065
Weekly average, 1937	6,257
Weekly average, October	4,732
Total to date, 1936	309,477
Total to date, 1937	294,084

Includes awards of 100 tons or more.

ton state will open bids for eight projects Nov. 30, involving 370 tons reinforcing in bridge and highway work.

Reinforcing Steel Awards

1160 tons, invitation A-33681-A, bureau of reclamation, Mexico City, Wash., to Knoxville Iron Co., Knoxville, Tenn.

700 tons, sewer, Chicago and Blue Island, Ill., for Chicago sanitary district, to Joseph T. Ryerson & Son Inc.

653 tons, Sutter bypass, Sutter county, California, to Ceco Steel Products Co., San Francisco.

400 tons, administration building, Buffalo sewage authority, to Buffalo Steel Co., Tonawanda, N. Y.

300 tons, 6-story department store, Coulter Dry Goods Co., Los Angeles, to unnamed interest.

270 tons, highway project RC 3919, Saratoga and Schenectady counties, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through A. I. Savin Construction Co., East Hartford, Conn.

200 tons, Medical Arts Center building, Beverly Hills, Calif., to unnamed interest.

165 tons, highway project RC 3918, Tiago county, New York, to Wickwire Spencer Steel Co., New York; through Mohawk Paving Co., Buffalo.

160 tons, dormitory, Purdue university, Lafayette, Ind., to Hugh J. Baker Co., Indianapolis.

138 tons, building, Polytechnic high school, Long Beach, Calif., to unnamed interest.

138 tons, crossing over Clark Fork river, Mineral county, Montana, to unnamed interest.

120 tons, federal aid project 48 and 49, route 2, Milford and Greenbush, Me., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Charles Andrews high school, Syracuse, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, abutments, Mississippi river bridge, La Crosse, Wis., to Minneapolis Bridge Co., Minneapolis.

100 tons, bridges, Central Railroad of New Jersey, Elizabeth, N. J., to Igoe Bros., Newark, N. J.; through Centaur Construction Co., New York.

Reinforcing Steel Pending

2000 tons, completion of Fort Peck dam, Montana; general contract bids Dec. 3.

500 tons, mesh, highway project, Sullivan county, New York; bids Nov. 30.

370 tons, Washington state bridge and highway projects; bids at Olympia, Nov. 30.

207 tons, over-crossing, Southern Pacific Co. tracks, San Luis Obispo county, California; bids in.

200 tons, highway, route 4, sections 36 and 37, Freehold relocation, Monmouth county, New Jersey; bids Nov. 29.

200 tons, highway, route 29, section 9A, North Plainfield-Scotch Plains, N. J.; bids Nov. 29.

190 tons, highway project, route 12, section 1, Hunterdon county, New Jersey; bids in.

175 tons, men's dormitory, Howard university, Washington; Charles H. Tompkins Co., Washington, low, $436,700, bids Nov. 12.

160 tons, viaduct superstructure, Broadview, Ill.

142 tons, five culverts, Montezuma and Dolores county, Colorado; bids Nov. 23.

140 tons, bureau of roads span, Mineral county, Montana; bids in.

130 tons, building, Coco-Cola Co., Providence, R. I.

125 tons, swimming pool, Wellesley college, Wellesley, Mass.

120 tons, Kenmore bridge, King county, Washington; bids in.

110 tons, building, Brown university, Providence, R. I., contractor taking bids.

102 tons, mesh and bars, overpass and approaches, route 25, section 29, Kearny, N. J.; bids Nov. 22.

100 tons, bridge over Rock creek near Shoreham hotel, Washington.

100 tons, bridge, route 25, section 3-C, Jersey City, N. J.; bids Nov. 22.

100 tons, tuberculosis hospital, Hamburg, Pa.; Karno Smith, Trenton, N. J., low on general contract.

Unstated, 105,000 pieces for Roza project, Washington; bids in to bureau of reclamation.

Unstated, state bridge in Gallatin and Flathead counties, Montana; bids in.

Cold Finished

Cold Finished Prices, Page 77

Pittsburgh — Previously booked automotive business has been sustaining operations of cold finishers in this district. In some cases a rate of 55 to 60 per cent was in force last week. Incoming specifications are at a low ebb, however, with consumers other than the automotive industry very hesitant to buy. In the experience of some cold finished bar sellers, so far this month new business is ap-

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proximately one-third under the corresponding period of October. Jobbers appear well stocked and unwilling to extend themselves until after the end of this year at least. Mill prices are reported holding up firmly.

Pig Iron

Pig Iron Prices, Page 78

Pittsburgh—Absence of any large domestic tonnage has prevented test of pig iron prices recently, but on spot carlot orders quotations have been virtually unbroken. With fewer furnaces active, the situation has been relieved to a certain extent. Shipments continue much lighter than expected, foundries being well supplied. Several large export inquiries were current early this month, but apparently have not been booked here. Prices on foreign business are understood to have fallen to the point where profits would be negligible.

Cleveland — Sellers note little change in market conditions with most foundries intent on reducing backlogs, which in many instances are far out of proportion to present requirements. With operations in many foundries reduced to two or three days a week, producers expect more than average tonnage will be carried over into first quarter. Agricultural equipment foundries are comparatively active in comparison to those foundries serving other industries. Prices are firm.

Chicago — November pig iron shipments are expected to fall 15 to 20 per cent below those of October despite a smaller letdown in foundry operations. Inventory reduction still is in process and only occasional new orders are received. Foundry schedules are well sustained in some industries but the general tendency is downward slightly. Higher freight rates advance delivered prices on pig iron up to 20 cents a ton.

Boston—Pig iron buying in small lots, generally less than car loads, marks a dull market. Despite lower operations by foundries, consumption for some weeks has been slightly above the buying rate. Against an old export order, 1000 tons has been shipped, while imports include 1015 tons of Dutch iron. Stocks of this iron for prompt spot delivery at Boston and Providence, R. I., are more ample. New freight rates have slight effect on deliveries to many New England points. There are no increases to Connecticut consuming points from Everett, Mass. The same applies to consumers in Rhode Island and Port Chester, N. Y., from Everett. Applying to all railroads, there is no increase in the switching rate in the Boston district. The new rates are effective to Worcester, Mass., however.

New York—Pig iron still is moving slowly, at the poorest rate this year. Such releases as do appear are of hand-to-mouth character and for prompt shipment. Consumers generally, with the approach of inventory season and with prospects for continued dull demand for castings over remainder of this year, are watching stocks closely. Foreign pig iron buying also is negligible, although considerable trade interest is being evinced in the recent purchase of more than 500,000 tons of scrap by Europe. This, some declare, should not only have a buoying effect on scrap prices with a resultant stimulating influence on pig iron prices, but may be the forerunner of some fair-sized European pig iron buying later.

Philadelphia—Pig iron buying has almost entirely disappeared, sellers reporting receipts of only occasional carlot orders. Practically all iron due against third quarter contracts was taken out and this has been sufficient to carry operations along into the present quarter. Consumption shows further reduction and some consumers may find it unnecessary to make fresh purchases until well into first quarter. Furnace stocks so far are not excessive and therefore are exerting no pressure on the market. Incidentally, rail-water shipments of Southern iron now are being made via Mobile, Ala., rather than Savannah, Ga.

Buffalo—A falling off in pig iron shipments was noted and a carry-over of fourth quarter bookings into next year is probable.

Indication inventories of foundries are depleted is seen in the increased number of orders. These, however, call for coverage of immediate requirements only.

Cincinnati—Shipments of pig iron have dropped, most melters under contract having taken out full November needs during the first half of the month to avoid higher freight rates. New buying is held to carlots. New delivered prices on Northern iron, include: Cincinnati, $24.27; Dayton, $25.39; Indianapolis, $25.87. Northern iron to Columbus takes Birmingham base, delivered price being $25.98. Southern iron, No. 2 foundry, delivered Cincinnati is $23.89, Dayton $25.01; Indianapolis $25.49.

St. Louis—While considerably below the preceding several months, shipments of pig iron during the first half of November have made a surprisingly good showing. Melters are apparently willing to take in quotas due on earlier contracts, and there have been no requests to hold back deliveries. The melt as a whole has declined sharply both at steel foundries and jobbing shops. A number of stove plants are down, and will remain closed until after the turn of the year. Implement, and tractors are the sustaining factor, but even at these establishments there has been curtailment, and further reductions are contemplated during the next few weeks.

Birmingham, Ala.—Continued in-

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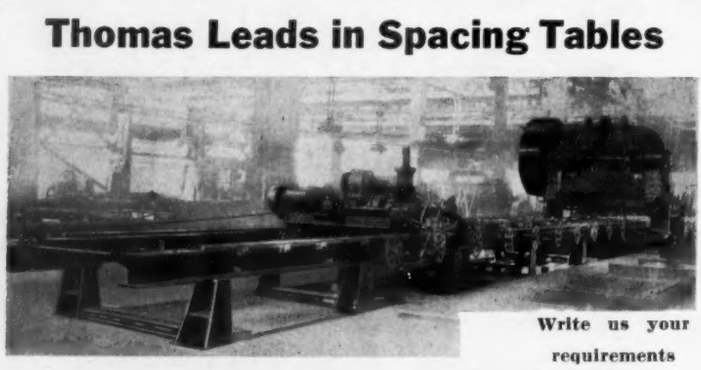
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activity marks the pig iron market with 15 furnaces in production, one more than last week, when T. C. I. blew in No. 6 at Fairfield, Ala. Producers report the market rather sluggish, but are not stocking a great deal of the product.

Scrap

Scrap Prices, Page 80

Pittsburgh—Scrap prices have been without change during the past week, although there is no indication either that the bottom has been reached or that an upturn might be forthcoming. Mills remain out of the market and dealers prefer to lay down and store material rather than sacrifice it at present quotations. It is doubtful if certain grades could be obtained by mills and metalworking consumers at the current nominal levels, but they are strictly in line with the heavy melting grades, which in turn are based upon the recent railroad lists.

Cleveland — Prices have been marked down about $1 on practically all grades, though there has been little buying as a test. Occasional carloads are being bought and consumers and dealers are laying down some tonnage, present prices being attractive.

Chicago—Scrap prices are 50 cents to $1 a ton lower. Sharp curtailment in scrap consumption is necessitating little new buying and the trade looks for little business during the remainder of the quarter. Distress offerings are relatively moderate, dealers being able to hold their accumulations while railroads are not disposed to sell large lots at present prices. Shipments to consumers against old contracts are light, with holdups still encountered at some points.

Boston—Scrap prices for domestic shipment continue to sag. With small demand lower prices result largely from efforts of yard dealers to discourage further heavy offerings rather than actual sales. For the second week prices for export are steady, although there has been limited buying to round out needs for more active ship loading, about 13,000 tons being loaded at Boston with additional cargo space on the way here and also to Portland and Providence.

New York — With domestic demand light prices continue to fall, brokers offering lower bids on a number of grades. The consumer at Phoenixville, Pa., is taking moderate shipments of No. 2 heavy melting steel at $12, delivered, but due to the longer haul none of this material is moving from this district. Prices for export continue steady and have remained so for about three weeks although buying for barge delivery is light. Most of this moves at $13 for No. 1 steel. The recent purchase of about 400,000 tons by the European scrap cartel has not yet had any effect on prices. More cargo space for export is available with considerable tonnage yet to be shipped against old orders. None of the tonnage in the recent purchase will be shipped until after January. It now appears one large export broker demanded $17 for No. 1 in the recent negotiations and still holds for that price.

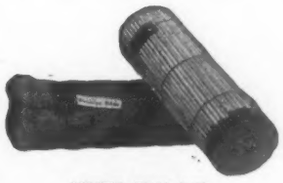
Philadelphia — Renewed broker buying for export has injected a new element of strength into central eastern market for scrap. Dealers are being offered $14.50, f.a.s., for No. 1 steel and $13 for No. 2. One boat is scheduled to arrive Nov. 29 and a second between Dec. 6 and 10. Other than the previously noted 5000-ton order booked from Italy by two Philadelphia yard dealers, this is the first evidence of export interest in some time. The domestic market is almost at a complete standstill. One mill, based on current operations, reports sufficient material on hand for requirements through April 1. Brokers are paying $12 for No. 2 steel for shipment to two points which substantiates the current quotation of $12 to $12.50. No buying of No. 1 steel domestically is reported but a range of $13.50 to $14 is considered representative, especially in view of prices offered for export.

Buffalo—While the iron and steel scrap market continues stagnant, nominal price ranges show a steadier tone as dealers continued to lay down stocks and await higher prices. Large dealers express the opinion that the scrap market now might well be considered a "buy." They explained that with the present nominal price of No. 1 melting steel scrap at $13 to $13.50 a ton it is selling $11 to $12 a ton less than pig iron, while this differential in past year has ranged around $6 a ton.

Detroit—Quiet rules in the scrap market pending test of present prices at the end of this month. Downward plunge of quotations appears to have been checked, although loose clippings are subject to pressure bringing them to $6.50-$7 per ton, and compressed sheets are weaker by 25 cents per ton. Some dealers are showing more inclination to sell, despite current low prices.

Cincinnati—Prices of iron and steel scrap are lower, with brokers and dealers finding few outlets for material. Low steelworks operations give little hope for an increased movement. Only a few items came into this district from recent railroad lists, bidding being so low that much material was withdrawn. Current requirements of mills and foundries, in consideration of their scrap inventories, are exceedingly light.

St. Louis—An otherwise stagnant and depressed market for iron and



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steel scrap has been enlivened by a purchase by an east side mill of between 12,000 and 15,000 tons of steel grades. The price was at current quotations and about $2 below the last previous purchase of similar material by this interest. This was the first sale of size in a number of weeks. The tonnage was split among five local dealers and is for delivery over the next 60 days. It includes heavy melting steel, steel wheels, rails, springs and frogs, switches and bars.

Birmingham, Ala. — The scrap market is quieter than for several months, an indication of the comparatively low steelmaking rate. Shipments are mostly in small lots, and dealers are not crowding the market.

Seattle—Immediate prospects are not promising, the market marking time, waiting for improved domestic conditions. At present export market and local demand are dormant. The Oriental situation is unchanged and rolling mills have ample stocks for present needs. Turnover is less than in more than a year.

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Warehouse

Warehouse Prices, Page 79

Pittsburgh — Shipments from warehouses are running behind the comparable October period. Very little improvement can be expected now until around the first of the year. Jobbers have noted a slight benefit recently due to the fact prompt delivery from mills is sometimes hard to obtain on small amounts because of mill's inclination to await an accumulation of orders before rolling. Prices are reported holding up fairly well.

Cleveland — A moderate improvement has been noted in the number of warehouse orders and aggregate volume shipped so far this month. The drastic decline in mill operations is an important factor in current demand. Stocks of most distributors are sufficient to supply estimated requirements over the next 30 days.

Chicago—Sales have dropped below October rate and are smaller than a year ago. The decrease the past six weeks has been more than seasonal, and further curtailment is seen for the rest of the quarter. Prices are reported steady.

New York—Moderate improvement in volume of warehouse buying centers largely around lighter steels, alloys and specialty lines, with heavier products, plates and structurals still dull. Jobbers are getting more tonnage from small buyers, who usually place small lots with mills. Deliveries on these are difficult for mills because of lack of volume to make rollings. Warehouse prices are not expected to advance as a result of the change in freight rates.

Philadelphia—Some jobbers report November volume about equal to that for the corresponding period of October. However, business undoubtedly is averaging well below usual seasonal levels. Keener competition pricewise is noted for business on the part of certain sellers.

Detroit—Demand for warehouse iron and steel products continues dull and receding as the year-end approaches. Increased freight rates, amounting to about 1 cent per 100 pounds, are so small that quotations are not being changed, and will be held at present levels until the ICC takes action on l.c.l. shipments within 60 to 90 days.

Cincinnati—Market for warehouse items is quiet, with volume likely to show a shrinkage compared to October. Industrial demand is broad, but light, and building needs are insignificant. Prices are being maintained firmly.

St. Louis—The recent cold weather has had the effect of stimulating certain seasonal items at warehouses. In the main, however, demand for all commodities remains sluggish, with buying on a strictly necessity basis. Oil country supplies are the bright spot at the moment. Warehouse stocks are generally complete, but prices on all standard commodities are firm.

Seattle — Jobbers report business back to almost depression levels, with no improvement expected before January. Fewer public works, curtailment of industrial activity, absence of private construction and general lack of confidence are given as the underlying factors. Wholesale jobbing price is well maintained.

Tin Plate

Tin Plate Prices, Page 76

New York—Local tin plate fabricators are consuming more metal than might otherwise be expected in view of the general letup in steel business. While canning requirements are seasonally down, there has been a fairly good tonnage moving into miscellaneous package containers. As a result some tinplate sellers predict that local consumers will carry little if any of the $4.85 tonnage they are working on into next year.

Moreover, certain canning requirements are more active, particularly for canning in Florida, where the season will soon be getting under way. Some fair sized tonnage at the $5.35 price for delivery in December has just recently been placed for fruit and vegetable packing in the south.

Tin plate manufacturers are expected to reaffirm prices for next year almost any time now and when this is done it will probably signalize the release of substantial specifications for delivery after the first of the year.

Export buying continues down from the volume of few weeks ago, as foreign consumers have not only covered on a fair portion of their winter needs, but have been inclined to hold off recently in the hope of

obtaining concessions in prices, as they are fully cognizant of the sharp slump in steel business in this country.

Tinplate producers, however, have held prices firmly on a parity with the domestic market. Further, they are not disposed to accept some offers made recently at current prices but involving delivery in the second quarter. Producers generally believe that later they will be able to do better than the current prices on export shipments in that period.

Pittsburgh — Operations of tin plate mills show a further contraction to around 63 per cent, and may be lower in the next week or two following the completion of present schedules, which consist largely of miscellaneous domestic and export bookings. It is usual at this time of year, however, that incoming business, shipments and operations should fall off after the end of the canning season. At this writing no announcement has been made concerning the 1938 contract price, but it is expected in the near future. In many quarters here it would not be surprising if the present price of $5.35, per base box, Pittsburgh, were maintained. This price, which is strictly for delivery during the fourth quarter, went into effect too late to be of great benefit to producers during the past season.

Youngstown, O. — Still completing order booked under the former price schedule, tin plate mills involved in last summer's CIO strike, have not yet opened negotiations with canners for the next year's requirements. It now is expected that the opening of such negotiations will be later than formerly, Probably not until around the middle of December or later.

Semifinished

Semifinished Prices, Page 77

Producers' stocks of semifinished steel are now well built up, although with any sizable increase in operations, needs for steel would be speedily felt. Nonintegrated producers are in one of the dullest cycles in the last 15 months and it is generally believed that no upturn can be expected any more this year. Skelp and wire rods are in fair demand. Export inquiry continues good, with prices considerably below the levels obtained during the peak months earlier this year. Forging shops are slightly more active than shipments of semifinished to these sources would indicate and apparently are drawing upon their inventories.

Approximately 15,000 tons of semifinished steel is pending here for England, in lots of 500 to 3000 tons. Offered prices figure back to less than $30, Pittsburgh equivalent and in general are too low to interest sellers.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 77

Bolt, nut and rivet specifications continue slow, retarded both by reduced consumption among leading users and tendency of buyers to curtail stocks further before taking additional shipments. Jobbers are placing few specifications and little business is coming from railroads. The farm equipment industry is maintaining its requirements better than are other leading consumers. Demand from automotive partsmakers still is disappointing.

Ferroalloys

Ferroalloy Prices, Page 78

New York—Apart from sagging prices on ferrotungsten in line with the easier trend in tungsten ore, there has been no change in ferroalloys quotations in recent weeks. As a matter of fact, there has been no revision in ferrotungsten over the past week, with the result that it is still holding at around $2 per pound tungsten contained, freight allowed in car lots.

Ferromanganese shipments this month again are down, with the possibility that they may set a new low record for the year to date. This reflects the continued sharp drop in steelmaking operations to a large extent, although the effect of this drop is still being cushioned slightly by some replacement orders from consumers who have been drawing largely from stocks laid in last June, at which time their old contracts at lower prices expired. The current market is $102.50, eastern seaboard, duty paid.

Domestic spiegeleisen shipments are also off sharply, due to the sharp reductions in steelmaking. Prices, however, are unchanged at $33, Palmerton, Pa., on 19 to 21 per cent material, and $39 on 26 to 28 per cent.

Metallurgical Coke

Coke Prices, Page 77

Immediate demand for coke continues dull, although shipments are maintained against contracts. Blast furnace operations are at the lowest point of the year in this district and only moderate shipments are being taken by industrial concerns. Koppers Co., Pittsburgh, will erect 15 new coke ovens at the American Rolling Mill Co. plant at Hamilton, O. The production of beehive coke for the calendar year to date is estimated by the United States bureau of mines at 2,895,700 net tons, compared to 1,363,100 net tons in the corresponding period of 1936. The daily average so far this year has been 10,927 net tons, against 5144 tons in the 1936 period. A further slowing down of beehive coke oven activities during the week of Nov. 6 brought total production down to 45,500 tons, the lowest level of the year to date, according to the bureau

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of mines. The decrease from the preceding week amounted to 3 per cent. Compared with the corresponding week of 1936, it was a decline of 29.5 per cent. Accumulated weekly production for 1937 to date is 112.4 per cent ahead of the same period of 1936.

Steel in Europe

Foreign Steel Prices, Page 79

London—(*By Radio*)—Decision by the Basic Steel association to maintain prices unchanged through 1938 has released a substantial volume of inquiry for 1938 delivery and some works are booked for the next six months. Pig iron makers are also well booked ahead. Export demand is subsiding and arrivals of semifinished steel from the Continent is increasing. Exports of tin plate and galvanized sheets are dull.

Steel and iron imports in October totaled 220,522 tons, a decline of 5678 tons from the 226,200 tons imported in September. Exports at 206,916 tons showed a gain of 9916 tons over the 197,000 tons exported in September.

The Continent reports export business is still restricted and price concessions have made American competition keen.

Iron Ore

Iron Ore Prices, Page 80

Cleveland — Despite the rather marked curtailment in shipments from upper lake ports in October, stocks of iron ore at the lower lake ports and furnaces Nov. 1 were approximately 8,100,000 tons more than on the comparable date last year. This condition reflects the abrupt decline in steelworks operations over the past 60 days. The Lake Superior Iron Ore association reports:

	Tons
Consumed in September.....	5,157,411
Consumed in October	4,203,873
Decrease in October	953,538
Consumed in October, 1936....	4,384,809
On hand at furnaces Nov. 1..	37,209,855
On Lake Erie docks Nov. 1....	6,056,572
Total on hand at furnaces and Lake Erie docks Nov. 1....	43,266,427
Reserve total Nov. 1, 1936....	35,156,099

Nonferrous Metals

Nonferrous Metal Prices, Page 78

New York — Nonferrous metal markets suffered another wave of pessimism last week as prices on the London Metal Exchange sank to new lows coupled with release of bearish statistical reports and a drying up of fresh inquiry.

Copper—Export copper eased to only 9.75c, c.i.f. European ports. Primary mine producers continued to quote electrolytic at 12.00c, Connecticut, while one custom smelter offered at 11.00c. The October statistical report showed an increase of 37,576 tons in world refined stocks.

Tin — Paced by an abrupt price drop in standard spot tin on the London Metal Exchange, prices in the domestic market sank to new lows since the early part of July, 1936. Straits spot closed here at 41.75c.

Lead—Demand was satisfactory during the first half of the week but tapered during the last half. Prices held at $5.00c, New York, and 4.85c, East St. Louis. Stocks of refined lead increased during October for the first time in fourteen months. The increase of 9904 tons was due to an increase in production coupled with lighter shipments.

Zinc — Prime western held unchanged at 5.75c, East St. Louis, despite the slowest sales rate in many months.

Antimony — Prices declined to 15.50c, New York, for American spot and to 15.75c, duty paid New York, for Chinese spot.

Industry "Needs Defense Against Government"

■ Private industry must make a vigorous defense against government attacks, said A. W. Robertson, chairman, Westinghouse Electric & Mfg. Co., before the chamber of commerce and the Life Underwriters' association in Pittsburgh recently. Speaking on "The Future of Private Enterprise," he declared:

"The series of government attacks on private enterprise is enough to make any sensible man wonder about its cause. It is almost certain, however, that such attacks are a reflection of a general public grievance. The only way I can explain this public grievance is to hark back to the old days of witchcraft."

Mr. Robertson further stated: "I know that predictions are dangerous, but every man is entitled to one shot in the dark. So I will predict that private enterprise will survive just as long as there is a government to heckle and control it.

"I submit that we have a great deal to save yet for private enterprise."

Regarding "death sentence" taxes, he said: "Just remember this — no death sentence has yet been executed. We're not in one of those countries where if a man doesn't suit, they stand him against a wall, and the next day there's a new chairman of the board. Stand up and lift your voices in honest defense of private industry!"

GENERAL ELECTRIC SUSPENDS GROUP INSURANCE PAYMENT

■ Some 60,000 employes of General Electric Co., Schenectady, N. Y., will be saved $90,000 to $100,000 through suspension of their contributions to the additional group life insurance plan for December. This applies to all employes except those who joined the plan since Jan. 1, 1937.

THE HANNA FURNACE CORPORATION
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Buffalo Detroit New York Philadelphia Boston

Witherbee Sherman Ore Land Leased by Republic

■ Republic Steel Corp., Cleveland, has leased from Witherbee Sherman Corp., Port Henry, N. Y., the latter's properties, including operating iron ore mines, a concentrating plant and a sintering plant at Minesville and Port Henry and about 100,000 acres of iron ore bearing land near Lake Champlain in Clinton and Essex counties, New York. Stockholders of Witherbee Sherman Corp. will hold a special meeting Dec. 6 at New York, to approve the lease. The lease is for 25 years, based on mining of 500,000 tons of ore annually. It covers also a subsidiary, Port Henry Mining Co.

Witherbee Sherman Corp. and its predecessors have been in business since 1849. Mines on its properties have been worked since before the Revolution and cannon used by the colonies were made from its ores. Republic Steel Corp. assumed management Nov. 15, pending approval of the lease. This action assures Republic a large addition to ore reserves and gives Witherbee Sherman a continuous market for its iron ore.

70-Car Train Limit Proposal Protested

■ Protests against the bill to limit freight trains to 70 cars were sent to congressmen from Pittsburgh and Allegheny county, Pennsylvania, by the Pittsburgh-Des Moines Steel Co., Pittsburgh.

In a letter signed by H. N. Holdren, traffic manager, the company pointed out hazards of operation would be increased by the larger number of trains at grade crossing, operating expenses would be increased $237,000,000 a year, which ultimately would be paid by shippers, and that the bill would prevent efficient and economical use of existing railroad power and facilities which have been especially built for full-capacity trains.

Wage-Hour Legislation Perils Yearly Earnings

■ "In its attempt to put a floor under wage rates the Black-Connery bill can succeed only in bringing down the ceiling of annual incomes and labor's yearly purchasing power, according to Allen W. Rucker and N. W. Pickering, business economists, in a study of the industrial situation. The study is published by Farrel-Birmingham Co. Inc., Ansonia, Conn., under the title, "The Peril of Wage and Hour Legislation".

Among official statistics cited are tables showing that the nationwide attempt in 1930-31 to stabilize wage rates did not succeed in maintaining annual income and that the NRA program, while raising wage rates, resulted in a decline in purchasing power of average annual incomes because of the resulting higher prices. It is pointed out also that none of these moves succeeded in increasing factory labor's share of industrial income.

$133,000,000 in Coke By-Products for Steel

More than $133,000,000 worth of coke by-products were produced by the steel industry in 1936, the American Iron and Steel institute estimates.

These by-products were produced in the manufacture of more than 33,400,000 tons of coke in the 9600 by-product coke ovens operated by the industry. Approximately 47,400,000 tons of coal were consumed in the coking process.

Bulking largest among the volatile products was gas, of which nearly 525,000,000,000 cubic feet valued at $85,400,000 were recovered. About 36 per cent of the gas was used to heat the coke ovens.

Next most important was tar, totaling more than 420,000,000 gallons, valued in excess of $18,000,000.

Almost $10,000,000 worth of ammonium sulphate and ammonia liquor were produced.

Dismissal-Pay Plans Outlined in Study

■ Formal plans under which extra compensation is given to workers whose services no longer are required are supported by at least 93 companies, a recent survey by the National Industrial Conference board indicates. In addition 60 companies have informal plans under which similar compensation is given in special cases on basis of merit or need. Nineteen other plans were operative during the depression but have been discontinued.

From 1930 to 1936, twenty-five companies with formal plans paid $5,286,820 to 12,180 displaced workers. The largest sum expended was in 1933 when 5054 discharged employes received $2,073,966.

Twenty-seven of the formal dismissal-compensation plans studied provide for uniform payments while 66 provide for payments graduated according to length of service and age. Most common amount in the uniform plans is two weeks' pay. Graduated plans more frequently are applicable to wage earners as well as salaried workers, and provide for more liberal payment. Of the 66 graduated plans 11 provide for payment of one week's pay for each year of service.

Battleship Steel Bids Show Varied Prices

New York — While identical bids were submitted Nov. 16 on many

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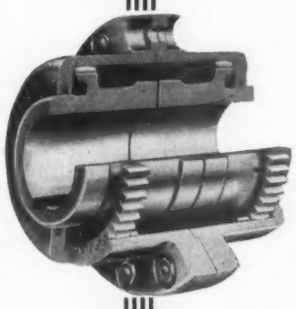

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items involved in 21,474 tons of plates, shapes, bars, strip and sheets for delivery to navy yards at Brooklyn and Philadelphia for preliminary needs for the battleships NORTH CAROLINA and WASHINGTON, some spreads with individual low bidders were established on the largest plate and bar tonnages involved.

Central Iron & Steel Co., Harrisburg, Pa., is low on 5400 tons of medium black plates equally divided between the two navy yards, bidding 3.04c, Brooklyn, and 2.945c, Philadelphia. On another inquiry for 4100 tons all bids quoted 3.10c, Brooklyn, and 3.02c, Philadelphia. The same prices were submitted for 2000 tons under lot 816, schedule 1978. Prices submitted on shapes were practically all identical.

Republic Steel Corp., Cleveland, is low on the largest bar inquiries, including 1000 tons of flat medium black bars, 500 tons to each yard, bidding 2.90c, Brooklyn and 2.83c, Philadelphia. The same mill is also low on 250 tons of galvanized bars under lot 815, schedule 1976. On 500 tons of medium black strip ½ to 6-inch widths, five mills submitted 3.32c, Brooklyn, and 3.28c, Philadelphia, as low.

Equipment

Pittsburgh—Machine tool orders have been at the dullest point of the year recently, although inquiries are better. Motor manufacturers remain active against previous bookings. Koppers Co., Pittsburgh, has been awarded the contract for 15 new by-product ovens at the American Rolling Mill Co. plant in Hamilton, O. The new ovens will be of the Becker low-differential under-jet type.

New York—Delay in closing on estimated machinery requirements has resulted in a decline in domestic orders and some of the volume out for figures has been temporarily withdrawn. There have been few cancellations of business already booked, a clause in most machinery contracts specifically guarding against such action on the part of purchasers. Most builders of metalworking machinery still have good backlogs, and, operating at a high rate are gradually improving deliveries. On heavier equipment, however, deliveries are still extended.

Seattle — While volume has declined and some lines are dormant, demand continues better than normal for electrical equipment, pumping units and road machinery. General industrial requirements are restricted by labor difficulties and curtailed production. Private plants are hesitant about making future commitments.

Chicago—Machinery and plant equipment markets continue quiet and hesitancy prevails among most users. Cancellations of existing orders have been few while only a relatively small number of pending inquiries have been withdrawn. Substantial backlogs of a number of machinery interests will prevent any sharp letdown in production this year but the outlook for first quarter has been affected adversely by the smaller number of inquiries. With railroads holding up freight car and locomotive building programs there is little possibility of any substantial buying of shop equipment. A number of roads have yet to issue any machinery inquiry in connection with preparation of 1938 budgets. Small tool buying continues to lag, currently being in the smallest volume of the year to date.

Construction and Enterprise

Michigan

DETROIT — Modell-Friedman Steel Corp., 1205 Beaufait street, will erect a new factory building at Schaefer and Joy roads.

DETROIT — Detroit Gasket & Mfg. Co. will erect a one-story addition to its plant on Burt road. H. D. Ilgenfritz, Detroit, is architect.

DETROIT — Lake Shore Steel Corp. has been formed to retail and wholesale steel, by Myron Fink, 6400 Wright street.

DETROIT — Penweld Corp., 6635 East Forest street, has been organized to engage in welding and laboratory work, by Glenn W. Watson, 2484 National Bank building.

EAST DETROIT — Dasco Products Co., 15913 Ethelyn court, has been incorporated with $150,000 capital to manufacture metal products, by Harry G. McKee, East Detroit, Mich.

HAMBURG, MICH. — Hamburg Mfg. Co., recently organized to manufacture hand and power tools, is completing construction of a factory building. (Noted Nov. 1.)

KALAMAZOO, MICH.—Atlas Press Co. recently completed a plant addition providing 15,000 square feet of additional floor space to increase production of bench lathes, shapers and drill and arbor presses.

LANSING, MICH.—Abrams Air Craft Corp. has been formed to manufacture aircraft, by Talbert Abrams, 606 East Shiawassee street.

MUSKEGON, MICH. — Sealed Power Corp. has plans by Giffels & Vallet, Marquette building, Detroit, architects, for erection of foundry building, costing $40,000.

NILES, MICH. — Garden City Fan & Ventilator Co. is having plans prepared for rebuilding its factory and office building. Estimated cost, including equipment, is $60,000.

SAGINAW, MICH. — Bay Refining Corp., 205 Bearinger building, recently formed with capital of $250,000, is considering purchase of site in Bay City, Mich., for erection of new plant, including power house, pumping station, steel tank storage and other facilities. Cost $150,000 with equipment.

WILLIAMSTON, MICH. — Walter Zimmer, village engineer, announces PWA has granted approval to village for erection of a 100,000-gallon water tank, pump house and pump.

WYANDOTTE, MICH. — Michigan Alkali Co. is planning to erect a new $1,000,000 plant here to produce chlorine and caustic soda under an English process, rights for the use of which were purchased from Imperial Chemical Industries of England. The new process will necessitate the construction of additional generating equipment to supplement the company's present power facilities.

YPSILANTI, MICH.—Shoecraft, Drury and McNamee, Ann Arbor, Mich., engineers, have completed plans for the construction of a sewage disposal plant to be built for the city of Ypsilanti. Estimated cost $202,000.

Connecticut

ESSEX, CONN. — Connecticut Light & Power Co., 36 Pearl street, Hartford, Conn., is having plans completed by L. Hamilton, 22 Church street, Meriden, Conn., for erection of power substation, costing $40,000.

MERIDEN, CONN.—Cuno Engineering Corp. is building an addition, 40 x 100 feet, two and a half stories, of modern design to cost about $40,000. The addition results from largely increased production of the company's industrial filter and need for additional space for a research and development department.

New York

NEW YORK — Magnus, Mabee & Reynard, 32 Cliff street, manufacturers of oils, plan installation of motors and controls, conveyors, electric elevators and other equipment in new six-story plant, laboratory and office building. Ely Jacques Kahn, 2 Park avenue, is architect in charge.

ROCHESTER, N. Y.—Lustre Chemical Corp., 182 Anderson avenue, producer of industrial chemicals, will rebuild plant recently destroyed by fire.

New Jersey

PAULSBORO, N. J. — Sandura Co. will repair and alter its plant. Cost with equipment $40,000.

Pennsylvania

MINOX, PA.—United States Fibre Box Co., H. J. Lacey, president, 1409 Roosevelt avenue, Indianapolis, has plans for erection of one-story, 60 x 200-foot, steel, corrugated iron factory. H. C. Genter, care of company, is engineer.

PHILADELPHIA—Associated Auctioneers Inc. will offer at auction Dec. 8-9 the machinery and equipment of the Girard Smelting & Refining Co., Tacony, Philadelphia. In addition to furnaces,

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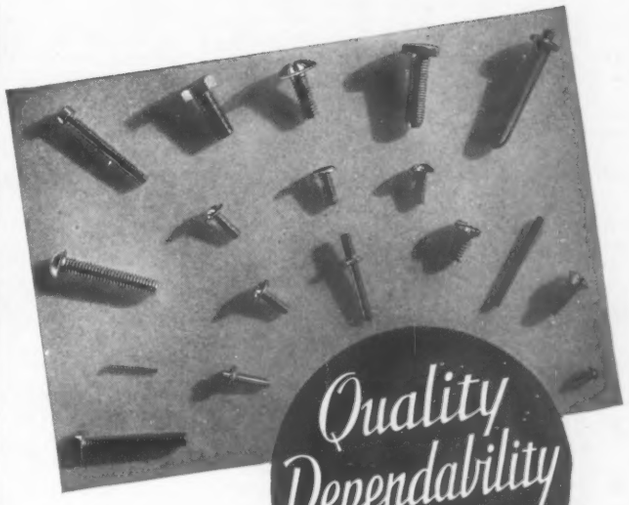

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Edward S. Lawrence

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Ohio

DAYTON, O.—Buckeye Iron & Brass Works Inc., East Third street, maker of steam engines, air compressors, valves, etc., has awarded general contract to Austin Co., Cleveland, for erection of one-story machine shop, 60 x 200 feet, to cost $75,000 with equipment.

WAPAKONETA, O. — Bids are being taken for furnishing and installing power plant equipment estimated to cost $128,000. Burns & McDonnell Engineering Co., Cincinnati, engineers.

WARREN, O. — Sunlight Electrical Co., Warren, plans erection of one-story plant here estimated to cost $400,000, with equipment.

Illinois

CHICAGO — Callaghan & Co., 401 East Ohio street, has plans by E. H. Clark, 8 East Huron street, for construction of 50 x 109 foot plant. Cost $100,000.

CHICAGO — General Porcelain Enameling & Mfg. Co. has purchased property at Grand and Natchez avenues, formerly occupied by Shafer Bearing Corp. The property will be used for expansion purposes by the General Porcelain company.

ROCKFORD, ILL.—Burd Piston Ring Co., Rockford, has acquired a factory building in Rockford containing 150,000 square feet of floor space, to be used for the manufacture of HaDees car heaters. Included in the purchase is five and a half acres of land available for further expansion. Manufacturing operations are expected to be under way soon and it is planned to move the general office into the new building.

Indiana

EVANSVILLE, IND. — Southern Indiana Gas & Electric Co. has approved plans for building a new indoor power substation on local site. Work will begin soon. Contract for building has been let to Anderson & Veatch, Evansville.

Alabama

BIRMINGHAM, ALA.—Jefferson Steel Co., 2615 Twenty-ninth avenue, North, has recently been organized with capital stock of $15,000 to produce sheet steel sheared to size. The firm is headed by T. J. Reid, president, and M. Hokin, secretary.

Maryland

BALTIMORE — City Auto Spring Works, 940 Park avenue, plans rebuilding factory recently damaged by fire.

HAGERSTOWN, MD.—Board of street commissioners has authorized improvements to municipal electric light plant at cost of $202,000. Wood & Kirkpatrick, engineers, Stock Exchange building, Philadelphia, are preparing plans and specifications. (Noted Nov. 6.)

Kentucky

BEATTYVILLE, KY.—City has voted $90,000 power plant bonds.

VANCEBURG, KY.—City voted $148,000 light and power plant bonds (Noted Oct. 4).

Florida

NEW SMYRNA BEACH, FLA. — City, Robert S. Fee, city engineer, is taking bids on iron and other materials and equipment for improvements and addition to power and light plant.

Georgia

CEDARTOWN, GA. — City takes bids Nov. 30 for construction of waterworks improvements, costing approximately $90,000.

UNADILLA, GA.—G. W. Baker, Danville, Ga., and L. L. O'Kelley, Cairo, Ga., are planning to construct a cold storage and curing meat plant of 300,000-pound capacity. Automatic power refrigeration equipment will be installed.

North Carolina

HIGH POINT, N. C.—Murray & Flood Engineering Co., 369 Lexington avenue, New York, has been awarded engineering contract at $250,000 for erection of hydroelectric plant on Yadkin river here. Estimated cost of plant $5,000,000.

Louisiana

LAKE CHARLES, LA.—Southwestern Oil & Refining Co., 915 Chapparral street, Corpus Christi, Tex., incorporated with capital of $175,000, plans to build an oil refinery here at cost of $100,000. Harry E. Clark, Weber building, Lake Charles, is president.

Tennessee

MEMPHIS, TENN. — Liberty Bottling Co., 1334 Florida street, has plans completed by W. C. Lester, Memphis, for bottling plant.

West Virginia

CHARLESTON, W. VA.—Public Service commission has issued permit to Monongahela West Penn Public Service Co. for construction of power plant and transmission lines

Oklahoma

ANADARKO, OKLA — City has preliminary plans for installing 5000-horsepower diesel engine and generator in light plant. Cost $75,000. N. Kinkel is engineer.

Wisconsin

GREEN BAY, WIS. — Northern Paper Mills Inc., contemplates selling two hydroelectric plants to Wisconsin-Michigan Power Co. and erecting a new steam generating power plant.

LA CROSSE, WIS. — E. G. Doudna, Madison, Wis., secretary, board of normal school regents, is about ready for bids on a new central heating plant, of the high-pressure steam type, costing $100,000.

MILWAUKEE—Oilgear Co., 1403 West Bruce street, maker of broaching machines, hydraulic feeds, etc., has let general contract to William F. Tubesing, 8011 Chestnut street, for erecting shop extension, 50 x 67 feet, costing about $35,000 complete. William D. Creider is general manager.

Iowa

ALLISON, IOWA — REA has allotted $105,000 to the Butler County Rural Electric Cooperative to complete construction of 235 miles of rural transmission lines in Butler and Hardin counties.

CLARION, IOWA — REA has allotted an additional $100,000 to the Wright county rural project to construct its second unit in a 340-mile project of transmission lines in Wright county. K. R. Brown, 902 Valley Bank building, Des Moines, Iowa, is chief engineer.

VINTON, IOWA — REA has allotted $100,000 additional funds for second unit of project to Benton County Electric Cooperative association. Complete project consists of construction of 418 miles of transmission lines. K. R. Brown, 902 Valley Bank building, Des Moines, Iowa, is chief engineer.

Nebraska

ALLIANCE, NEBR. — City, R. W. Laing, city clerk, is taking bids to Nov. 29, for one 2000-kilowatt turbogenerator costing $58,000, and one surface condenser, costing $21,000, to be installed in new municipal power plant. Plans and specifications obtainable from clerk or Black & Veatch, engineers, 4706 Broadway, Kansas City, Mo. Certified check of 5 per cent to accompany bid. (Noted Oct. 25).

BLAIR, NEBR. — City council has authorized clerk to advertise for bids soon on the purchase of a new diesel engine for the municipal light plant to cost about $55,000. Henry Christensen is city clerk. (Noted Oct. 18).

KEARNEY, NEBR. — Buffalo County Public Power district, Frank H. Wheeler, superintendent, is taking bids to Dec. 1 on construction of 142 miles of rural transmission lines to serve 328 customers in Buffalo county costing about $212,000. Robert Fulton, Lincoln, Nebr., is consulting engineer.

Pacific Coast

LOS ANGELES — Building permit has been issued to Motor Grinding Co., 6410 McKinley avenue, for construction of a new machine shop, 40 x 61 feet.

LOS ANGELES — Western Insulated Wire Inc. has established a new plant in Los Angeles at 1001 East Sixty-second street, where a building with 20,000 square feet of floor space has been leased and machinery installed for the manufacture of core wire, lamp cords, heater cords, etc. A. D. Nast Jr. is president, and Edward H. Lewis, vice president.

LOS ANGELES — Keene Rotary Engine Corp. recently filed articles of incorporation with the secretary of Sacramento, claiming exclusive license of a novel rotary steam engine. Capitalized at $100,000 the firm is directed by C. W. Keene and W. Fordyce, both of Los Angeles; H. DeVaney, Alhambra, Calif.; Prof. B. Richardson and Dr. R. I. Guy, of Glendale, Calif.

ORANGE, CALIF. — Building permit has been issued for construction of a new warehouse at 403 West Maple avenue, Orange, for the Anaconda Wire & Cable Co.

SAN DIEGO, CALIF. — A new boat factory will be erected here for the Warren Boat Co. It will be a one-story structure, of mill construction, 100 x 250 feet.

KLAMATH FALLS, OREG. — Brosterhous Construction Co., local contractor, was low at $61,999 to build a hydroelectric plant for the Enterprise irrigation district.

SPOKANE — Russell Furnace Co. has purchased a three-story factory building at 2921 Broadway and is installing machinery and equipment costing $28,000. President R. C. Russell announces plans for adding a foundry plant.

Canada

WINDSOR, ONT. — Ford Motor Co. of Canada Ltd., care of R. J. Porter, chief engineer, plans constructing machine shop addition to cost $300,000. Total of $1,400,000 will be spent for equipment.

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Protects Its Employes

To the Editor:

We have read very carefully the article on the investment plan for insurance of the Joslyn Mfg. Co., in STEEL of Nov. 15.

I would be very glad to have the opportunity of reviewing other plans for employe investments that may be in effect in other plants.

We have had in effect in our organization for many years group life, group health and accident, hospitalization and annual bonuses, all of which are financed by the company.

The hospitalization plan provides hospital service to any employe or any member of his family, up to a certain fixed maximum. The company pays 85 per cent of the entire cost.

We have never attempted any savings or investment plans.

L. E. KINN

President and General Manager,
Seneca Wire & Mfg. Co.,
Fostoria, O.

Why Not Help Industry?

To the Editor:

Reading in STEEL, Nov. 22, how Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has equipped a shop for the manufacture of electric motors on an assembly line I wondered how critics of industry can continue to berate modern methods.

This is only another chapter in the effort of industry to make the greatest use of materials and labor to the end that products may be made at prices the user can pay, thus bringing equipment costs down. By this means waste is prevented, corners are cut and a final result is that the standard of living for the entire American people is raised.

It is an old story that automobiles that formerly cost $1 per pound now cost only about 25 cents per pound. The same is true of various things that formerly were luxuries and now are necessities, put within the reach of users of moderate means instead of being enjoyed only by the rich.

It would seem the part of wisdom for the new deal to co-operate with industry in this constant effort to make better products at lower prices, constantly raising the general level of living for all. Yet the aim of the present administration seems to be to obstruct in every way the efforts of industry to bring a higher standard.

Business is constantly moving away from "horse and buggy" methods toward economical processes that make for less costly, and at the same time better, products. Yet in every economic move the new deal seeks to hamper such efforts.

It is a hopeful sign that congress seems to be taking the bit in its teeth and proposing revision in taxation to relieve the penalties that tend to restrict application of better methods. May we hope for success to these better counsels?

MANUFACTURER

Pittsburgh.

It Was Ever Thus

To the Editor:

I am enclosing herewith a short observation taken from Elbert Hubbard's scrap book. It seems to me that this applies about as well to the present time as it probably did when it was written. As you of course know, Elbert Hubbard was lost at the time the LUSITANIA was bombed.

I am simply passing it along to you for what it is worth and you are welcome to it.

W. S. WELLMAN

President,
Wellman Products Co.,
Cleveland

Editor's Note—Mr. Wellman's excerpt from the Hubbard scrapbook is as follows, applying well to present conditions:

"This country is suffering from over-legislation. Our reformers seem to have small faith in natural law. They have an eczema for regulating things. When they realize on their little thousand dollar policies, and they reach another world, they will want to seize the pitchfork and run the place to suit themselves.

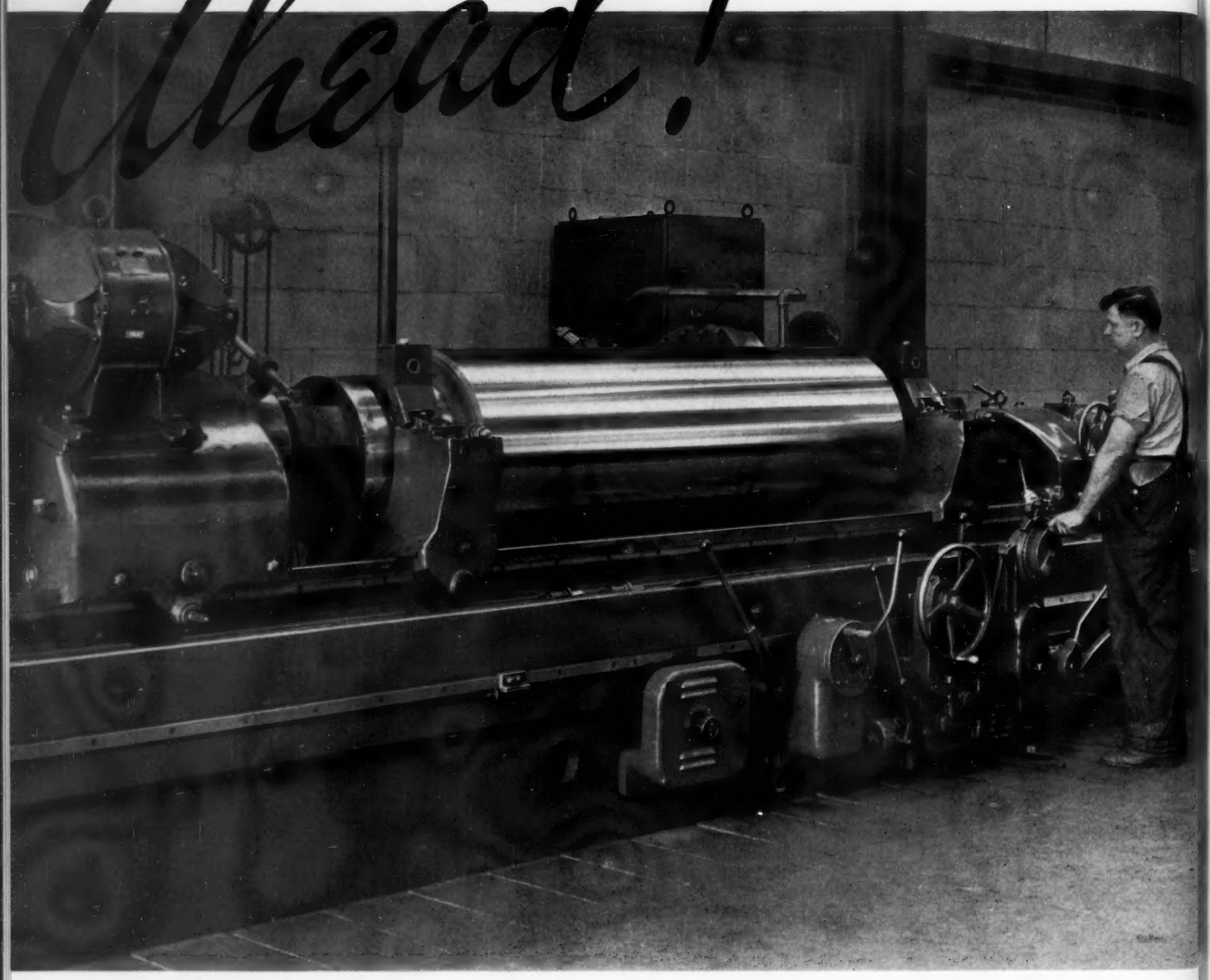
What this country really will have to do is to reform its reformers. We live in a marvelous country and in a marvelous time. Let the age unfold—let the times blossom—let humanity grow and expand.

"The dark ages were a time when by over-government human evolution was absolutely blocked. Let us cease being brakemen, and give conductors and engineers a chance. The country is all right or will be as soon as we repeal a few silly laws and give God's law of gravitation a chance.

"Cease putting your brake against the power."

ELBERT HUBBARD

Ahead!"



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